Hydraulic Through Frame Slide-out

SERVICE MANUAL

LIPPERT COMPONENTS™

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Warning, Safety, and System Requirement Information

Description

The Lippert Hydraulic Through Frame Slide-out System is a rack and pinion guide system utilizing a hydraulic cylinder to move the room assembly. The power unit drives the cylinder rod in a forward and backward motion to move the slide room in and out. The Lippert Hydraulic Slide-out System is designed to operate as a negative ground system.

Safety Information

⚠WARNING

The "WARNING" symbol above is a sign that a service or maintenance procedure has a safety risk involved and may cause serious injury or death if not performed safely and within the parameters set forth in this manual.

Always wear eye protection when performing service or maintenance to the vehicle. Other safety equipment to consider would be hearing protection, gloves and possibly a full face shield, depending on the nature of the service.

This manual provides general service and maintenance procedures. Many variables can change the circumstances of the service procedure, i.e., the degree of difficulty involved in the service operation and the ability level of the individual performing the operation. This manual cannot begin to plot out procedures for every possibility, but will provide the general instructions for effectively servicing the vehicle. In the event the skill level required is too high or the procedure is too difficult, a certified technician should be consulted before performing the necessary service. Failure to correctly service the vehicle may result in death, serious injury or voiding the warranty. The owner's manual for the unit may have more procedures for service and maintenance.

⚠WARNING

Failure to act in accordance with the following may result in death, serious injury, coach or property damage.

The Lippert Hydraulic Through Frame Slide-out System is intended for the sole purpose of extending and retracting the slide-out room. Its function should not be used for any other purpose or reason than to actuate the slide-out room. To use the system for any reason other than what it is designed for may result in damage to the coach and/or cause serious injury or even death.

Before actuating the system, please keep these things in mind:

1. Parking locations should be clear of obstructions that may cause damage when the slide-out room is actuated.
2. Be sure all persons are clear of the coach prior to the slide-out room actuation.
3. Keep hands and other body parts away from slide-out mechanisms during actuation. Severe injury or death may result.
4. To optimize slide-out actuation, park coach on solid and level ground.

Prior to Operation

Prior to operating the Lippert Hydraulic Through Frame Slide-out System, follow these guidelines:

1. Coach should be parked on the most level surface available.
2. Leveling or stabilizing system should be actuated to ensure coach will not move during operation of slide-out system.
3. Be sure battery is fully charged.
4. Be sure to keep all people and pets clear of slide-out system during operation.

⚠ CAUTION

Always make sure that the slide-out room path is clear of people and objects before and during operation of the slide-out room. Always keep away from the slide rails when the room is being operated. The gear assembly may pinch or catch on loose clothing causing personal injury.

NOTE: Install transit bars (if so equipped) on the slide-out room during storage and transportation.

Operation

Extending Slide-out Room

1. Level the coach.
2. Verify the battery is fully charged and hooked up to the electrical system.
3. Remove transit bars (if so equipped).
4. Press and hold the IN/OUT switch (Fig. 1) in the OUT position (Fig. 1B) until room is fully extended and stops moving.
5. Release switch, which will lock the room into position.

NOTE: Only hold OUT switch until room stops.

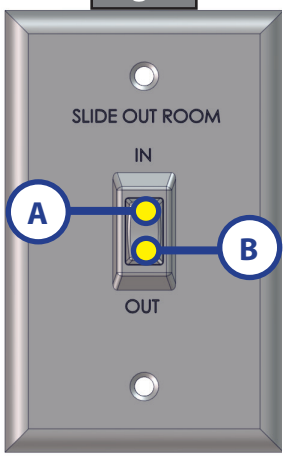
Retracting Slide-out Room

1. Verify the battery is fully charged and hooked up to the electrical system.
2. Press and hold the IN/OUT switch (Fig. 1) in the IN position (Fig. 1A) until the room is fully retracted and stops moving.
3. Release the switch. This will lock the room into position.

NOTE: Only hold IN switch until room stops.

4. Install the transit bars (if so equipped).

Fig. 1



Maintenance

Inspection

After servicing the slide-out system in any way, be sure to check the following:

1. Slide-out stops are installed and adjusted properly.
2. Head assemblies are installed and adjusted properly.
3. System is mounted properly.
4. Cross shafts are mounted properly and clear all other components.
5. Gear packs function properly.
6. Manual override is accessible.
7. Outside seals compress when slide-out is retracted.
8. Inside seals compress when slide-out is extended.
9. Slide-out extends and retracts smoothly.
10. Both sides of slide-out are synchronized.
11. Any dirt or debris is cleaned from the interior or exterior of the coach.

System Maintenance

The Lippert Through Frame Slide-out System has been static tested to over 4,000 continuous cycles without any noticeable wear to rotating or sliding parts. It is recommended that when operating in harsh environments (road salt, ice build up, etc.) the moving parts be kept clean. They can be washed with mild soap and water. No grease or lubrication is necessary and in some situations may be detrimental to the environment and long term dependability of the system.

Electrical System Maintenance

For optimum performance, the slide-out system requires full battery current and voltage. The battery must be maintained at full capacity. Other than good battery maintenance, check the terminals and other connections at the battery, the control switch, and the system for corrosion, and loose or damaged terminals. Check motor leads under the trailer chassis. Since these connections are subject to damage from road debris, be sure they are in good condition.

NOTE: The Lippert Through Frame Slide-out System is designed to operate as a negative ground system. A negative ground system utilizes the chassis frame as a ground and an independent ground wire back to battery is necessary. It is important that the electrical components have good wire to chassis contact. To ensure the best possible ground, a star washer should be used. Over 90% of unit electrical problems are due to bad ground connections.

Mechanical Maintenance

Although the system is designed to be almost maintenance free, actuate the room once or twice a month to keep the seals and internal moving parts lubricated. Check for any visible signs of external damage after and before movement of the travel trailer.

NOTE: For long-term storage: It is recommended that the room be closed (retracted).

Troubleshooting

Troubleshooting Introduction

This troubleshooting chart outlines some common problems, their causes and possible corrective actions. If any part or serial number information is available, provide it to the service technician when asking for assistance.

The Lippert Slide-out System is only one of four interrelated slide-out room system components. These four components are: chassis, room, coach, and Lippert Slide-out System. Each one needs to function correctly with the others or misalignment problems will occur.

Every coach has its own personality and what may work to fix one may not work on another even if the symptoms appear to be the same.

When something restricts room travel, system performance will be unpredictable. It is very important that slide tubes be free of contamination and allowed to travel full distance (Stroke). Ice or mud buildup during travel is an example of some types of contamination that can occur.

When you begin to troubleshoot the system, make sure the battery is fully charged, there are no visible signs of external damage to the system and that all connections are secure.

During troubleshooting, remember that if you change something, that change may affect something else. Be sure any changes you make will not create a new problem.

You can obtain additional information on the Lippert Slide-out System by visiting www.lci1.com/customerservice or by calling 574-537-8900.

What Is Happening?	Why?	What Should Be Done?
Room doesn't move when switch is pressed.	Restriction or obstruction inside or outside of unit.	Check for and clear obstruction.
	Low battery voltage, blown fuse, defective wiring.	Check battery voltage and charge if needed. Find and check fuse, replace if blown. Check battery terminals and wiring. Look for loose, disconnected or corroded connectors.
Power unit runs but room does not move.	Restrictions both inside and outside of unit.	Check for and clear restriction.
Power unit runs, room moves slowly.	Low battery, poor ground, extremely low outdoor temperature.	Charge battery and check ground wire.
Room drifts in both the "in" and "out" positions.	Possible external leak in the hydraulic system.	Tighten fittings.
		Inspect hoses, fittings and power unit for external leaks.
	Air in system.	After checking all connections, cycle pump several times in and out.
In the closed position, room drifts out.	Leaking cylinder seal.	See cylinder test next page.
	Fluid bypassing cylinder piston.	See cylinder test next page.
	Hose from pump is leaking.	Tighten fitting or replace hose.
	Air in system.	After checking all connections, cycle pump several times in and out.
	Loose mounting bolts.	Tighten mounting bolts.
In the open position, room drifts in.	Hose from pump is leaking.	Tighten fitting or replace hose.
	Leaking cylinder seal.	See cylinder test on next page.
	Fluid bypassing cylinder piston.	See cylinder test on next page.

Hydraulic slide-out cylinder retract test

1. Retract (close) all slide-outs (rooms) completely.
2. Disconnect all rooms from system (if coach is equipped with IRC, close all but one room).
3. Loosen hose from "E" (extend) port on the manifold of the power unit.
4. Plug opening on manifold to prevent drawing air into the system.

⚠ CAUTION

Do not attempt to run room out with the "E" port hose loose. The system will experience rapid fluid loss.

5. Energize the pump unit to retract (close) room.
6. When room is fully retracted, continue to run the room in and watch for fluid flow from hose/port "E". Fluid flow greater than a few drops will indicate internal cylinder leaking (bypassing of piston seal). If greater than a few drops leak from hose fitting, piston seal is bad and will need to be replaced. If there is no fluid flow, reconnect hose to "E" port and tighten.
7. Repeat steps 2 through 6 for each slide-out until all slide-outs have been tested. Energize the pump unit to retract (close) room.

⚠ CAUTION

Be sure to reconnect and tighten hose at the "E" port before attempting to extend (open) the room or the system will experience rapid fluid loss.

Hydraulic slide-out cylinder extend test

1. Extend (open) all slide-outs (rooms) completely.
2. Disconnect all rooms from system (if coach is equipped with IRC, open all but one room).
3. Loosen hose from "R" (retract) port on the manifold of the power unit. Individual slide-outs can be tested if the unit is equipped with an IRC block. Close all valves in IRC except the one to be tested.
4. Plug opening on manifold to prevent drawing air into the system.

⚠ CAUTION

Do not attempt to run room in (retract) with the "R" port hose loose. The system will experience rapid fluid loss.

5. Energize the pump unit to extend (open) room.
6. Continue to run the room out and watch for fluid flow from hose/port "R" (or IRC block if coach is equipped with IRC). Fluid flow greater than a few drops will indicate internal leaking (bypassing of piston seal). If greater than a few drops leak from hose fitting, piston seal is bad and will need to be replaced. If there is no fluid flow, reconnect hose to "R" port and tighten.
7. Repeat steps 2 through 6 for each slide-out until all slide-outs have been tested.

⚠ CAUTION

Be sure to reconnect and tighten hose at the "R" port before attempting to retract (close) the room or the system will experience rapid fluid loss.

Fluid Filling Procedure

NOTE: See next page for hydraulic fluid recommendations.

For best operation, fill system to within ½" of the top when all slide-outs are completely retracted. The see-through reservoir makes it easy to check fluid level. It is recommended that the fluid level be checked prior to operating the system. Make sure the breather cap is free of contamination before removing, replacing or installing.

1. Remove Breather/Fill Cap (Fig. 2).
2. Pour ATF into Breather/Fill opening.

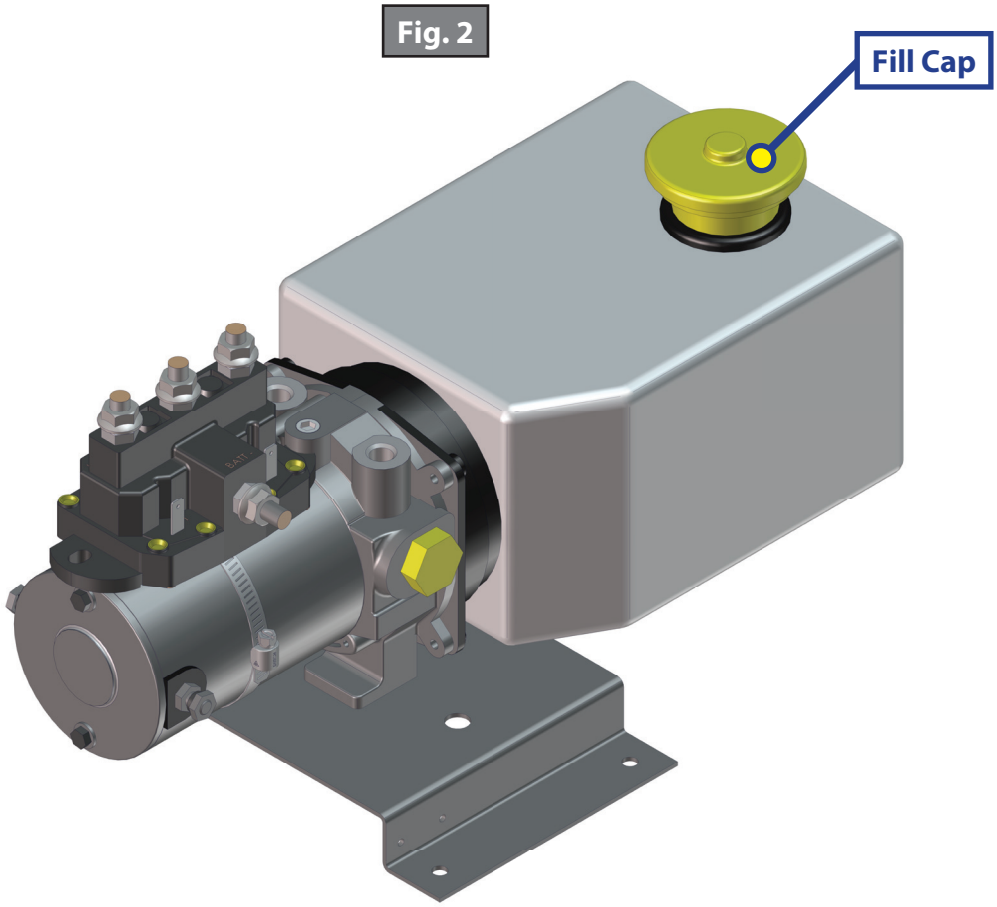
NOTE: Do not allow any contamination into reservoir during fill process.

NOTE: Standard reservoir holds approximately 2 quarts (1.89 liters) of ATF.

3. Fill to within ½" of top.
4. Replace Breather/Fill cap when finished.

NOTE: System is self-purging. By simply cycling the system 2-3 times, any air in the system will be forced back to the reservoir and out of the Breather/Fill cap.

Fig. 2



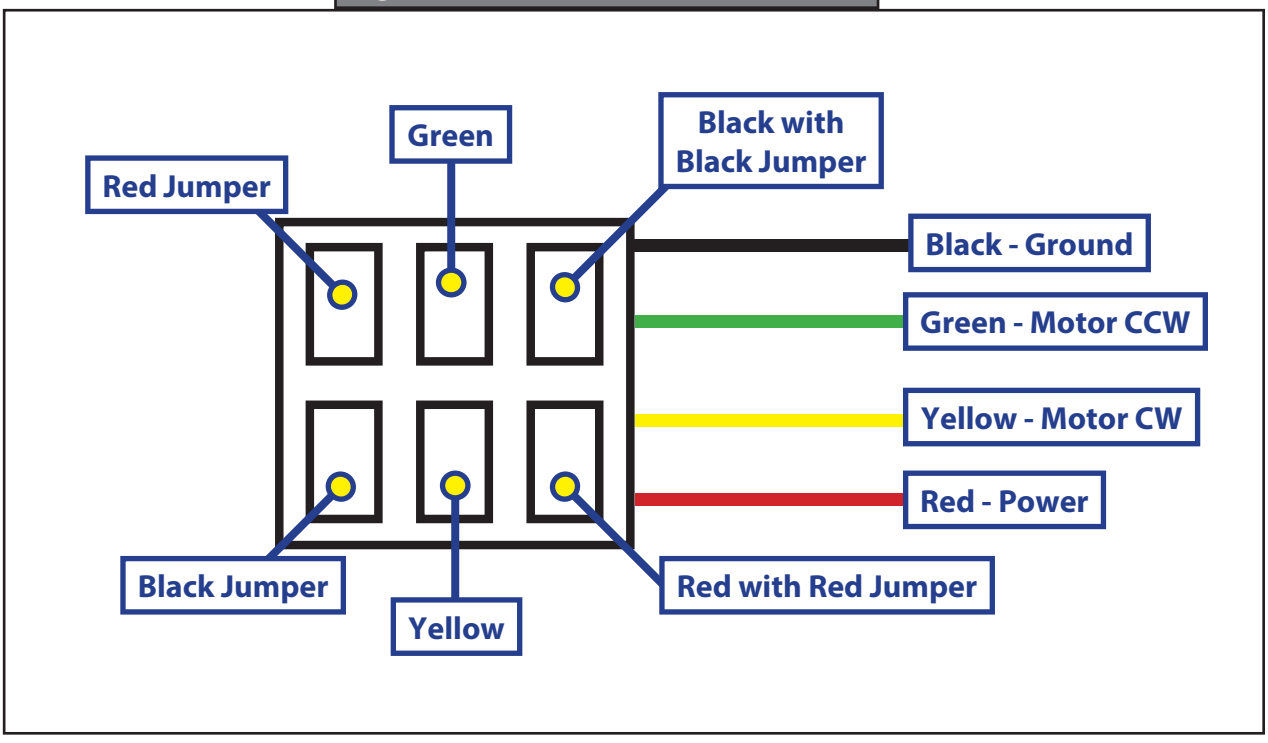
Motor Troubleshooting

Before attempting to troubleshoot the motor, make sure an adequate power source is available. The unit batteries should be fully charged or the unit should be plugged into A/C service with batteries installed. Do not attempt to troubleshoot the motor without assuring a full 12V DC charge.

The following tests require only a DC voltmeter (or DC test light) and a jumper lead.

1. Attach voltmeter (or test light) leads to the negative and positive switch terminals on back of wall switch. Does the meter indicate 12V DC? If **YES**, see **Step 2**; if **NO** see **Step 3**.
2. If **YES**, at the motor, check the incoming leads to 12V DC (if necessary, disconnect leads at wire splices). Does meter indicate 12V DC? If **YES**, motor needs to be replaced. The motor is not field serviceable. DO NOT ATTEMPT TO REPAIR. If **NO**, Inspect all wires and connections between the wall switch and the motor. Repair connections as necessary. Recheck as in **Step 1**.
3. If **NO**, Inspect all connections between battery and switch. Inspect 30A Auto-reset Circuit Breaker (See Page 14). Recheck as above in **Step 1**.
4. Since there are no field serviceable parts in the motor, electrical troubleshooting and service is limited to replacing only those components as previously outlined.
5. Thorough inspection of wiring and connections is the only other electrical service that can be performed.

Fig. 3 - Slide-out Switch Color Codes



Hydraulic Fluid Recommendations

Operation Conditions

1. **Above Freezing**

NOTE: Operation at air temperatures routinely above 0°C (32°F). *

- **A.** Dexron 3/Mercon ATF
- **B.** Mercon 5 ATF
- **C.** Dexron 6 ATF
- **D.** PetroBlend (Mason City, IA) PHO 0022S (synthetic group 3 base blend)
- **E.** Bellman all temp 22 (Bremen, IN)
- **F.** Or any ATF or hydraulic fluid with a pour point lower than -42°C (-45°F).

***Covers most initial OEM fills**

2. **Below Freezing**

NOTE: Operation at air temperatures routinely below 0°C (32°F).

- **A.** Mobil 1 full synthetic ATF
- **B.** Royal Purple full synthetic ATF
- **C.** Valvoline full synthetic ATF
- **D.** Amzoil full synthetic ATF
- **E.** PetroBlend (Mason City, IA) PHO 0022S (synthetic group 3 base blend)
- **F.** Bellman all temp 22 (Bremen, IN)
- **G.** Or any ATF or hydraulic fluid with a pour point lower than -42°C (-45°F)
- **H.** Multivis (all temperature) iso 22 hydraulic fluid
- **I.** Or any ATF or hydraulic fluid (conventional or synthetic) with a pour point lower than -46°C(-50°F).

3. **Extreme Cold**

NOTE: Operation at air temperatures routinely below -18°C (0°F).

- **A.** Kendall Glacial Blue
- **B.** Benz oil (Milwaukee, WI) Flomite 530

Or any conventional or synthetic ATF or hydraulic fluid with a pour point less than -57°C (-70°F) and viscosity less than 2850 cP @ -40°C (-40°F).

⚠ CAUTION

Do not use ATF-TYPE F fluid as it will not allow the seals to work properly.

Comparing 14.5° and 20° Rack and Pinion Gears

1. Start by measuring the distance between two individual adjacent teeth.
2. Using calipers or a steel rule, measure from the inside edge of one tooth (A), and then measure over to the inside edge of the next tooth (B) shown in (Fig. 4).
3. The 14.5° rack will measure approximately 0.170 inches (Fig. 5). The 20° rack will measure approximately 0.231 inches (Fig. 6).
4. The 14.5° rack will have 4 teeth per inch (Fig. 7). The 20° rack will have 3 teeth per inch (Fig. 8).

Fig. 4 - Side View

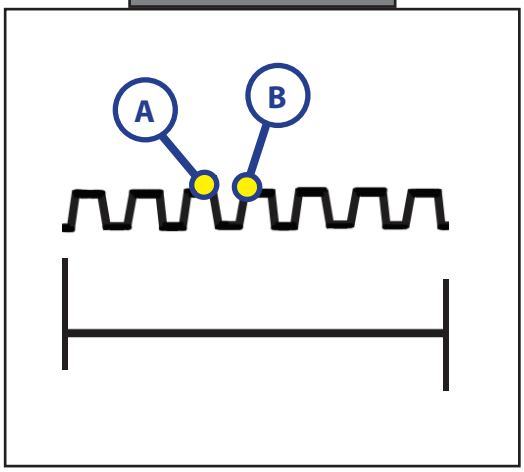


Fig. 5 - 14.5° Rack

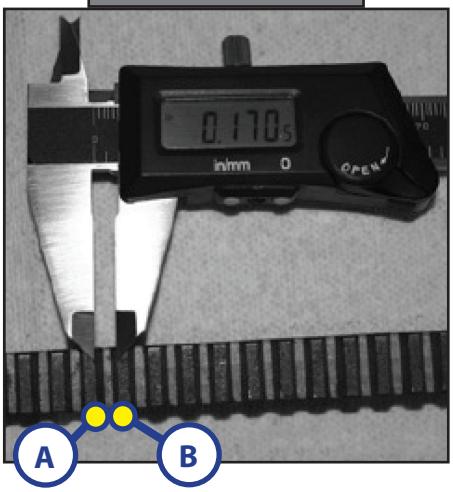


Fig. 6 - 20° Rack

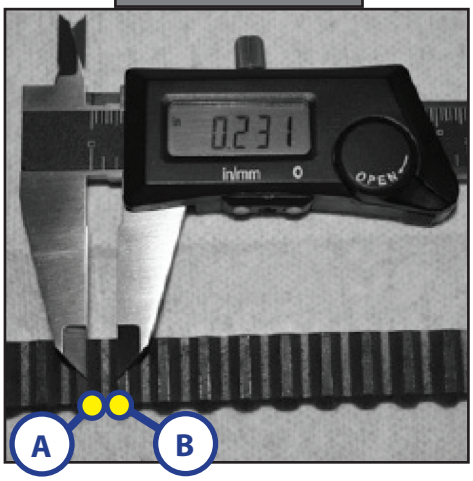


Fig. 7- 14.5° Rack

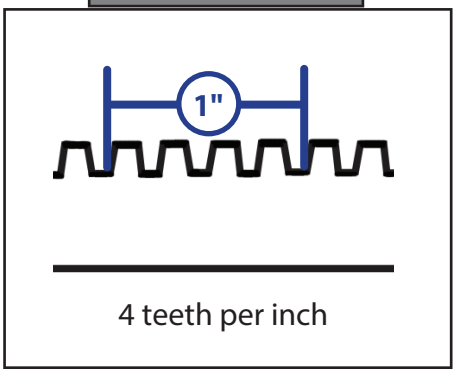
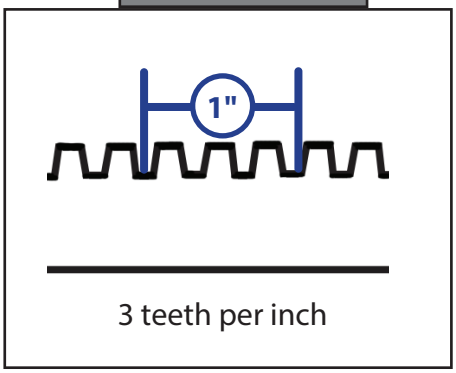


Fig. 8 - 20° Rack



The simplest way to differentiate between the 14.5° spur gear and the 20° spur gear is the number of teeth on the gear. Spur gear 122739 (Fig. 9) has 18 teeth. Spur gear 101941 (Fig. 10) has 15 teeth.

Fig. 9

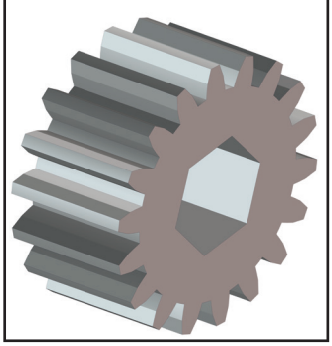
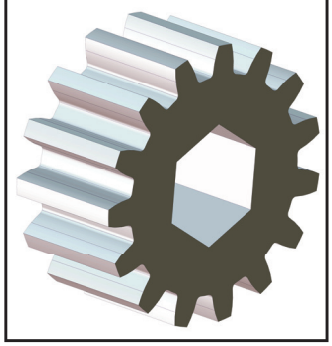


Fig. 10



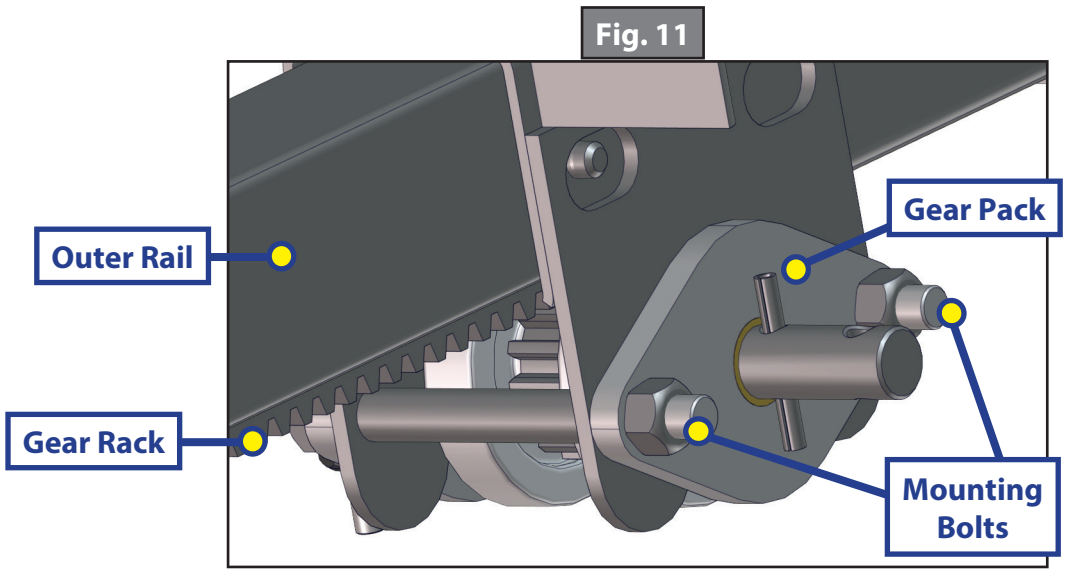
Gear Pack Replacement Instructions

In the event a gear pack needs to be replaced, follow these steps:

1. Run slide-out room half way out.
2. Place a jack under the inner arm of the slide-out.
3. Jack room up just enough to remove pressure off the gear pack.
4. Remove drive bolt from the cross shaft.
5. Remove bolts which hold the gear pack assembly in place on the outer rail.
6. Drop out the damaged gear pack.
7. Install the new gear pack.
8. Install bolts to hold gear pack assembly in place on the outer rail.
9. Install cross shaft and bolt.
10. Gear pack assembly does not need to be torqued down, only adequately and securely tightened.

Gear Packs	
281331	2 x 2
140409	2 x 3, 3 x 3
122837	Standard 2.5 x 2.5
123356	Heavy Duty 2.5 x 2.5
140418	Embedded Rack

Fig. 11



Corrective Action for Squeaking Gear Packs

Fig. 12

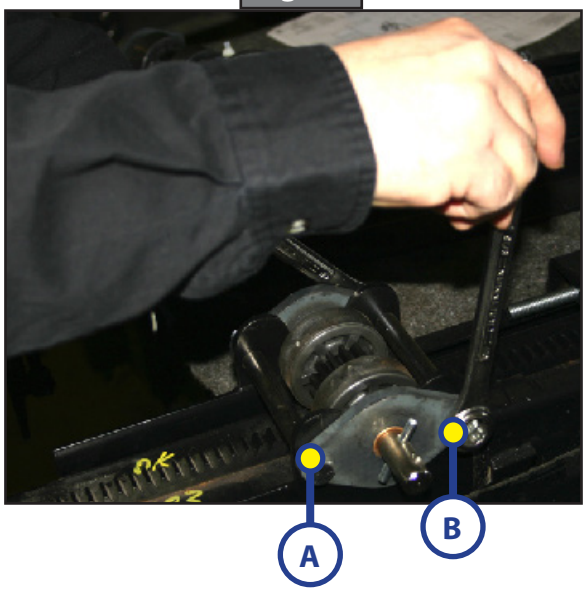


Fig. 13

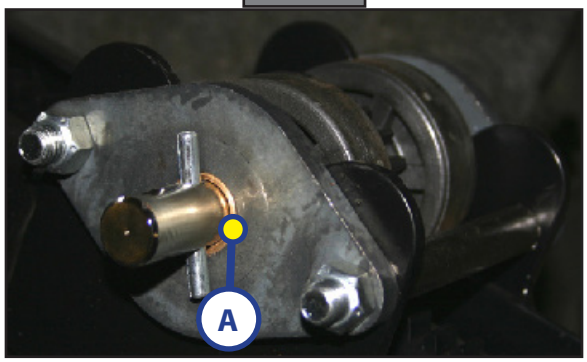


Fig. 14

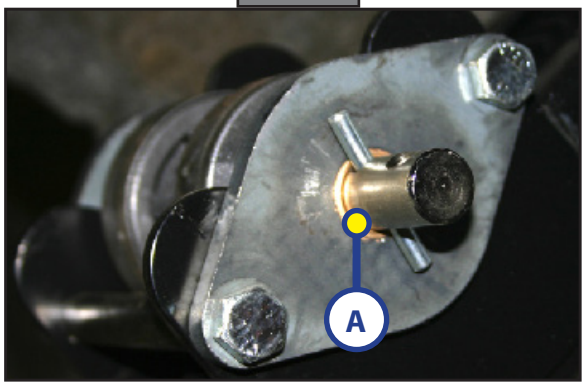
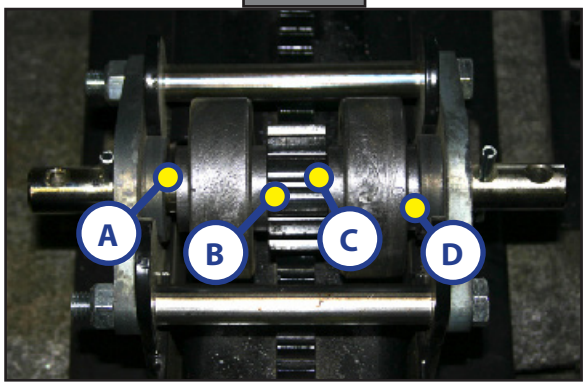


Fig. 15



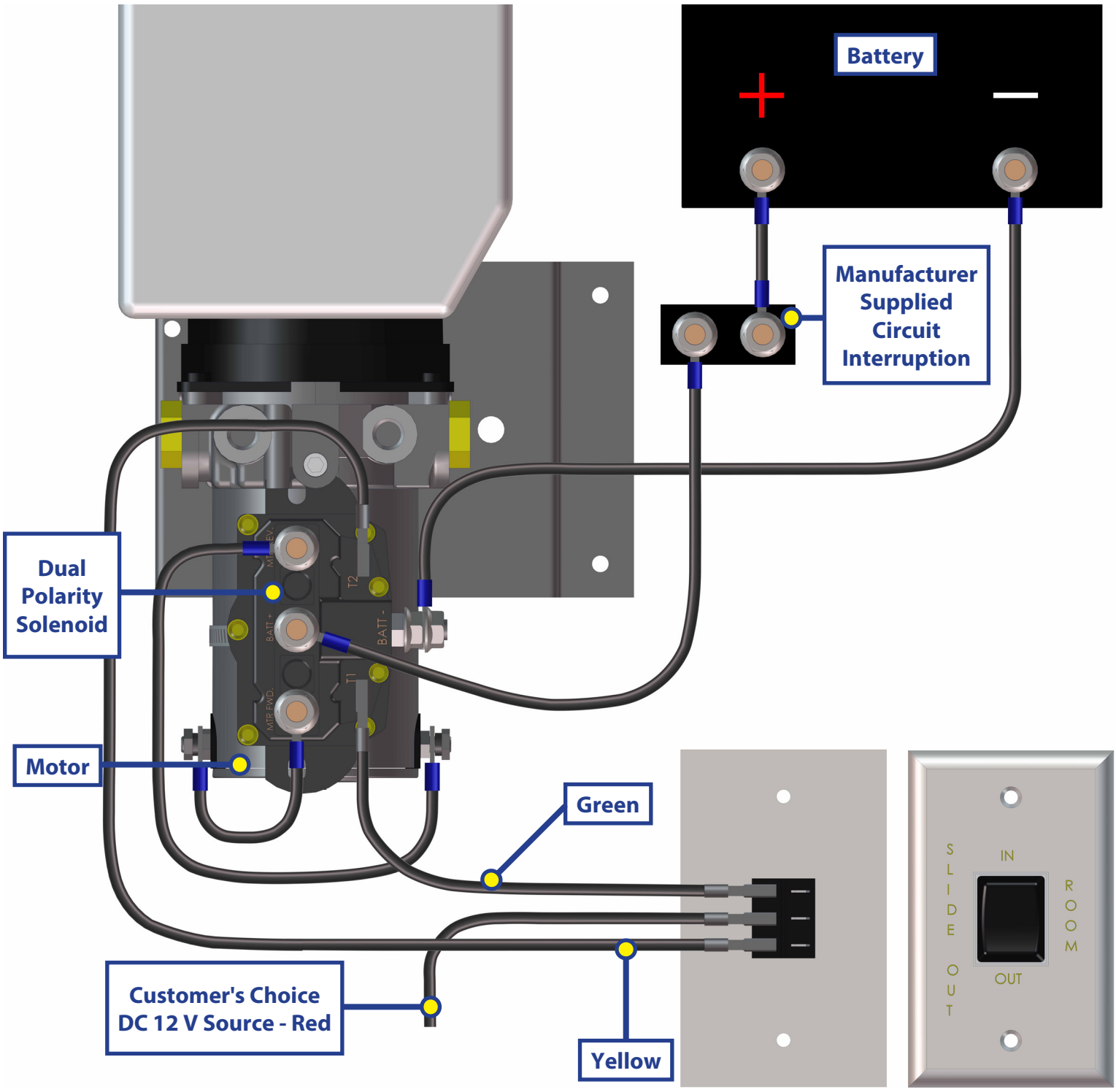
1. Loosen both gear packs bolts (Fig. 12A and B) until tension is off of the gear pack.
2. Using a manual pump oil can, pump 2-3 squirts of synthetic motor oil onto gear pack drive shaft in lubrication points (Fig. 13A), (Fig. 14A), (Fig. 15 A through D).

NOTE: Do not lubricate rack or pinion gear teeth, lubricate drive shaft only.

NOTE: LCI recommends Mobile One Fully Synthetic 10W-30 Motor Oil to lubricate gear pack.

3. Extend and retract slide-out arms several times to work lubricant through gear pack.

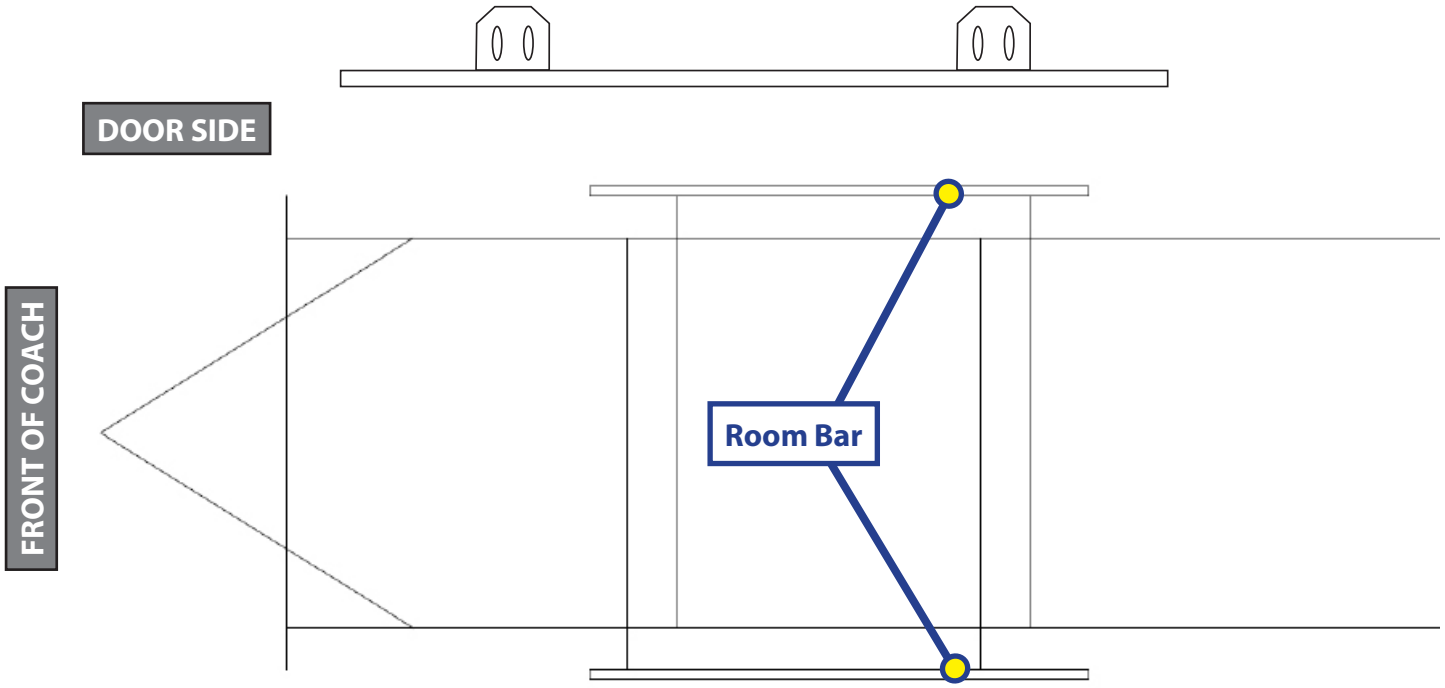
Wiring Diagram

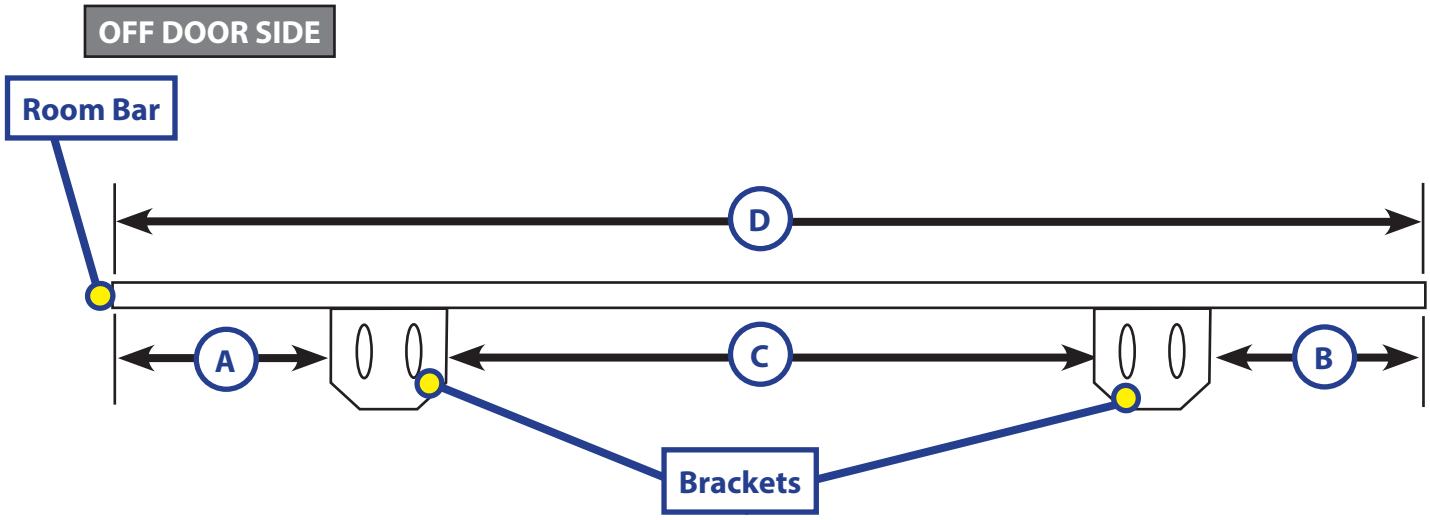


NOTE: Change in polarity reverses motor

Room Bar Measurement Chart

1. Circle which side of your coach this room bar is for (Door Side or Off Door Side).
2. Enter the measurements for A, B, C, and D on the lines at the bottom.





A_____ B_____ C_____ D_____

Adjusting room so it seals in the IN position

1. Locate cylinder coming through the frame.
2. Run room partially out.
3. Hold jam nut (Fig. 16A) in place with wrench.
4. Adjust Nylock nut (Fig. 16C) towards the bracket if the room does not seal. Adjust the Nylock nut (Fig. 16C) away from the bracket if the room is too tight and damages the fascia.

NOTE: Make small adjustments, running the room in after each adjustment until proper seal is achieved.

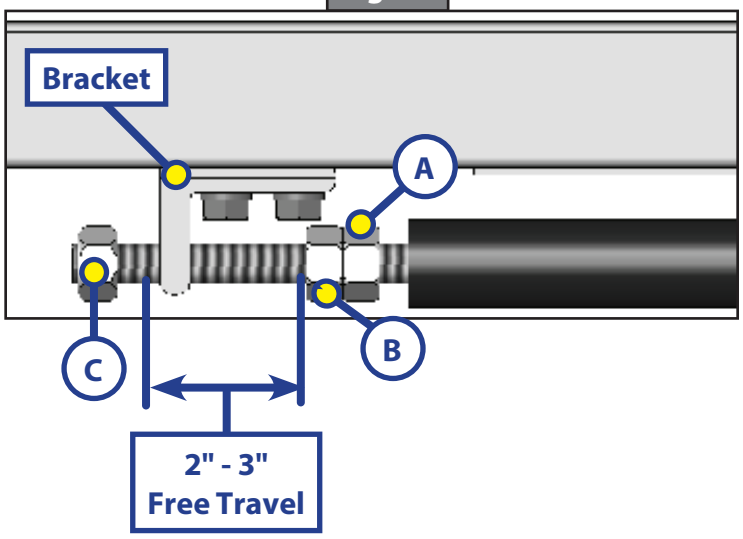
Adjusting room so it seals in the OUT position

1. Locate cylinder coming through the frame.
2. Extend room completely out.
3. Check the inside fascia and seal positioning.
4. Partially retract room.
5. Loosen and back off jam nut (Fig. 16A) from nut (Fig. 16B) to give nut (Fig. 16B) room for adjustment.
6. Adjust nut (Fig. 16B) away from the bracket if the room extends too far and damages the inside fascia. Adjust nut (Fig. 16B) towards the bracket if the room does not seal.

NOTE: Make small adjustments, running the room out after each adjustment until proper seal is achieved.

7. Tighten jam nut (Fig. 16A) to nut (Fig. 16B).

Fig. 16



NOTE: 2" to 3" of free travel is normal.

Vertical & Horizontal Room Adjustment

NOTE: All slide-out room adjustments must be performed by certified service technicians. Adjustments made by non-certified persons may void any and all warranty claims.

Horizontal adjustment

1. Loosen 2 carriage bolts (Fig. 17A) on each bracket located at the end of each guide tube.
2. Room is ready to be positioned horizontally by pushing on the outside, sidewall or by using a prying device inserted into the opening between the room and coach.

NOTE: Use caution when using prying device so seals do not become damaged.

Fig. 17

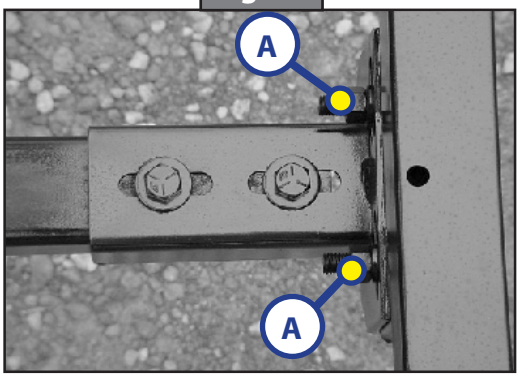
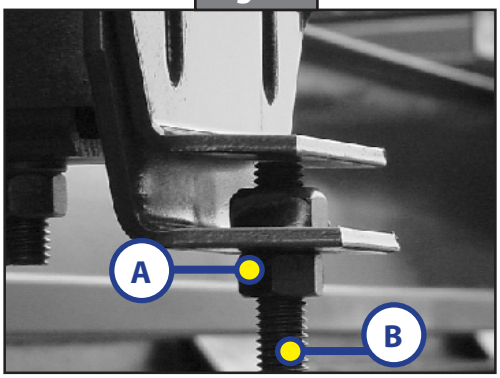


Fig. 18



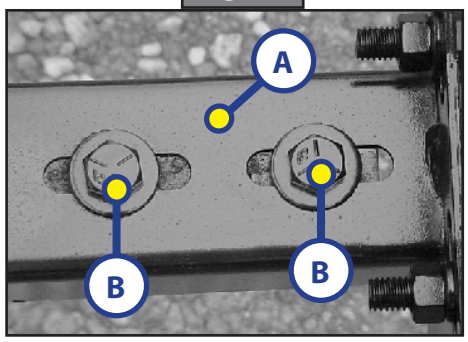
Vertical adjustment

1. Loosen 2 carriage bolts (Fig. 17A) on each bracket located at the end of each guide tube.
2. Loosen jam nut (Fig. 18A).
3. For vertical adjustment, turn vertical adjustment bolt (Fig. 18B) up or down to locate room height.
4. Once room height is located, tighten jam nut (Fig. 18A) and 2 carriage bolts (Fig. 17A).

Synchronizing Room Travel

The Lippert Hydraulic Slide-out System room travel (both sides of the room traveling the same distance) can be adjusted with a specially-designed synchronizing bracket mounted on the passive slide tube. The passive slide tube is the one that is not powered. The active slide tube is the one that has the cylinder attached. If one side of the room fails to seal, adjust as follows:

Fig. 19



1. Extend the slide-out about halfway out.
2. Measure the active side from the "T"-molding on the slide-out back to the outside wall of the coach.
3. Then, measure the passive side in the same manner.
4. Loosen bolts (Fig. 19B) on top of the passive slide tube (Fig. 19A).
5. Push or pull room (on passive side) to align the passive side with the active side.
6. Tighten bolts (Fig. 19B) to secure the passive side position.
7. Retract room and run as normal.

Extend and retract cylinder port locations

Fig. 20 - Standard Slide-out Cylinder

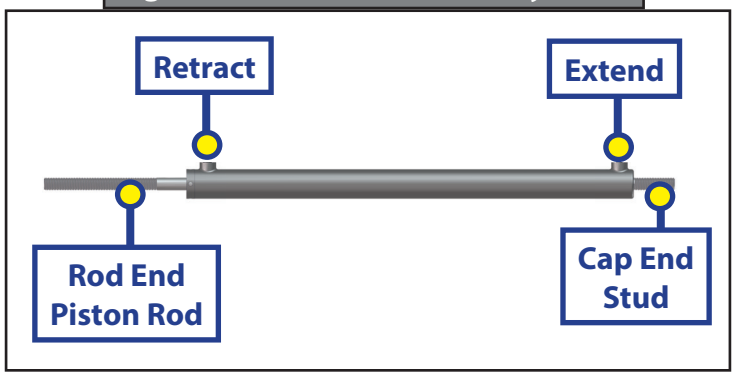
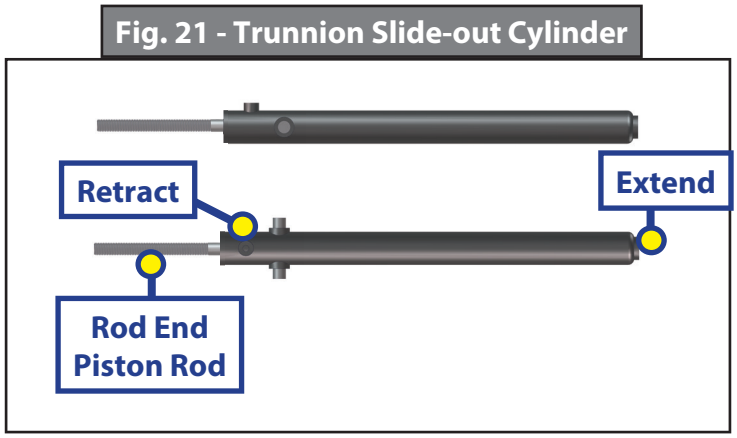


Fig. 21 - Trunnion Slide-out Cylinder



Manual Override

The Lippert Hydraulic Slide-out System can be run with auxiliary power devices like electric drills, ratchet wrenches or screwdrivers. In the event of electrical or system failure, this manual method of extending and retracting the slide-out room can be used. A standard hand-held drill is all that is required. A standard 38" room will take approximately 45 seconds to retract. See the instructions below.

1. Remove protective label (Fig. 22A).
2. Using a standard hex bit, insert auxiliary drive device (cordless drill, screwdriver, or ratchet wrench) into coupler found under protective label (Fig. 23).
3. Run drill counterclockwise to extend slide-out room and clockwise to retract slide-out room.

Fig. 22

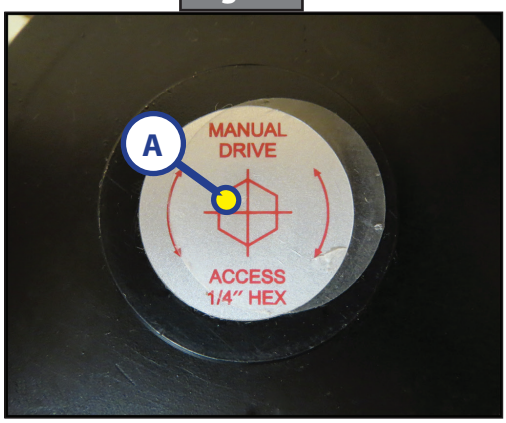
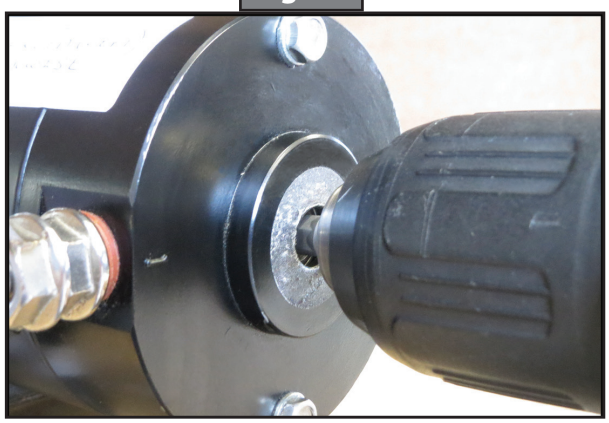
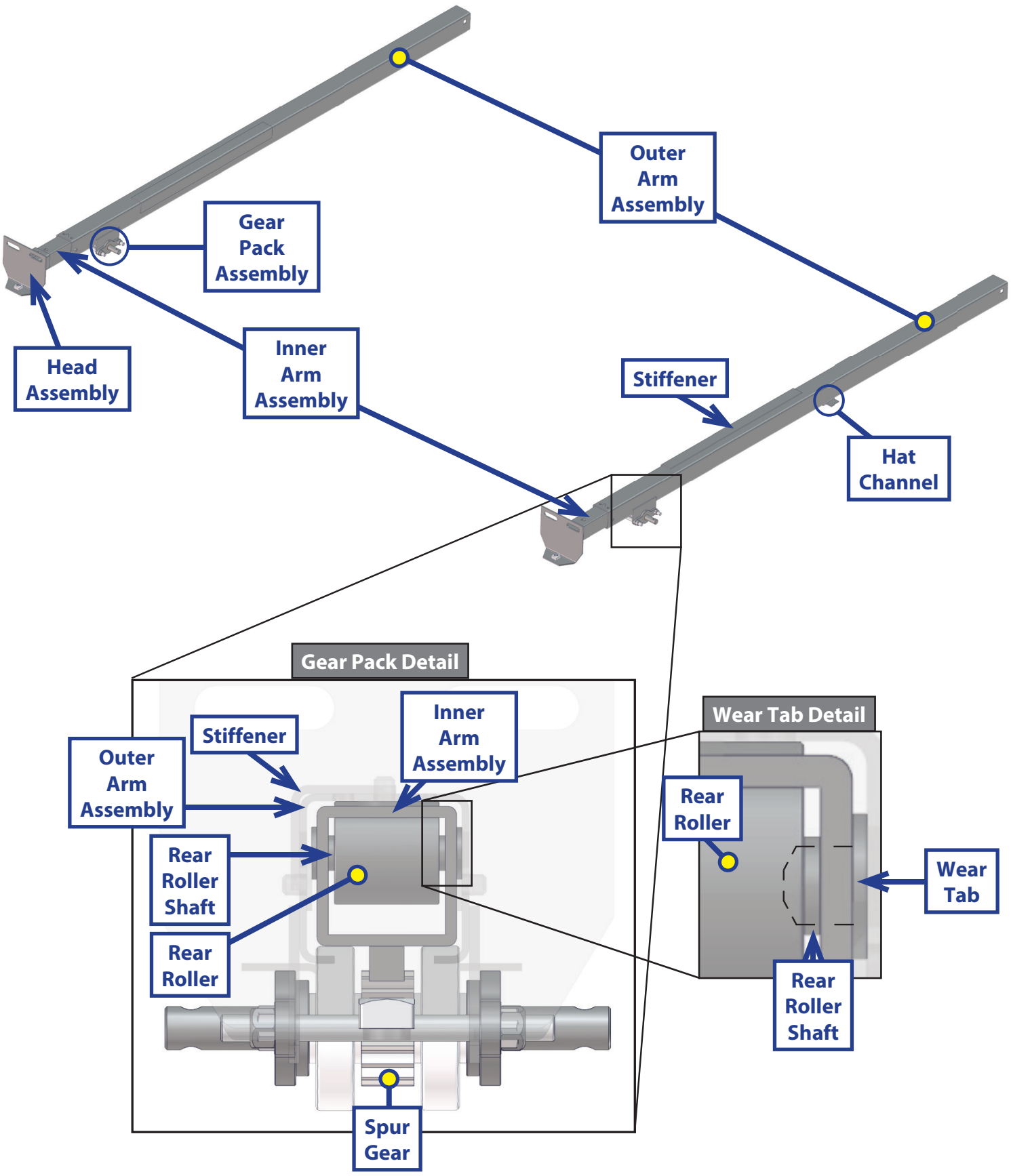


Fig. 23

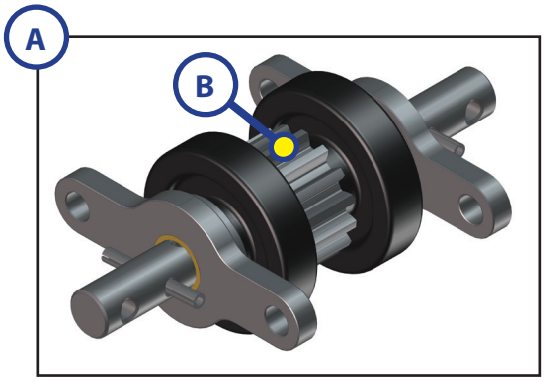


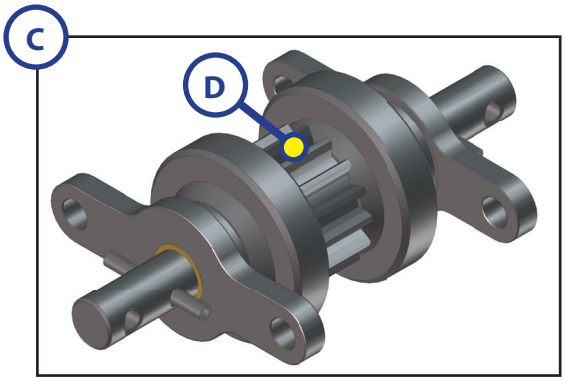
2 X 2 HYDRAULIC THROUGH FRAME SLIDE-OUT ASSEMBLY

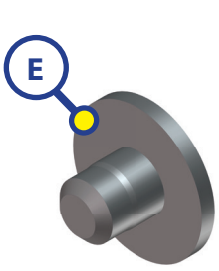


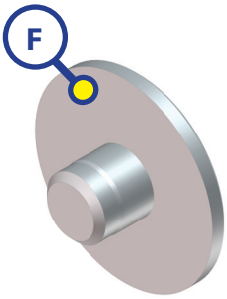
2 X 2 HYDRAULIC THROUGH FRAME SLIDE-OUT COMPONENTS

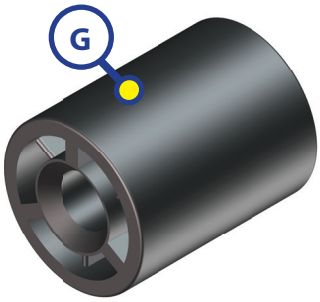
SLIDE-OUTS

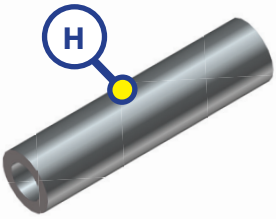


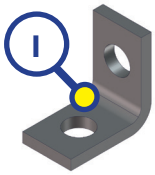


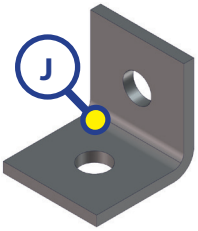


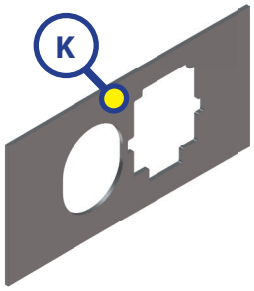


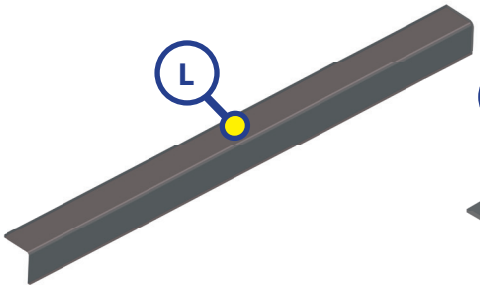


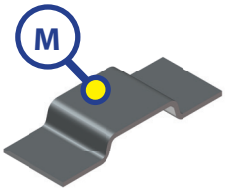






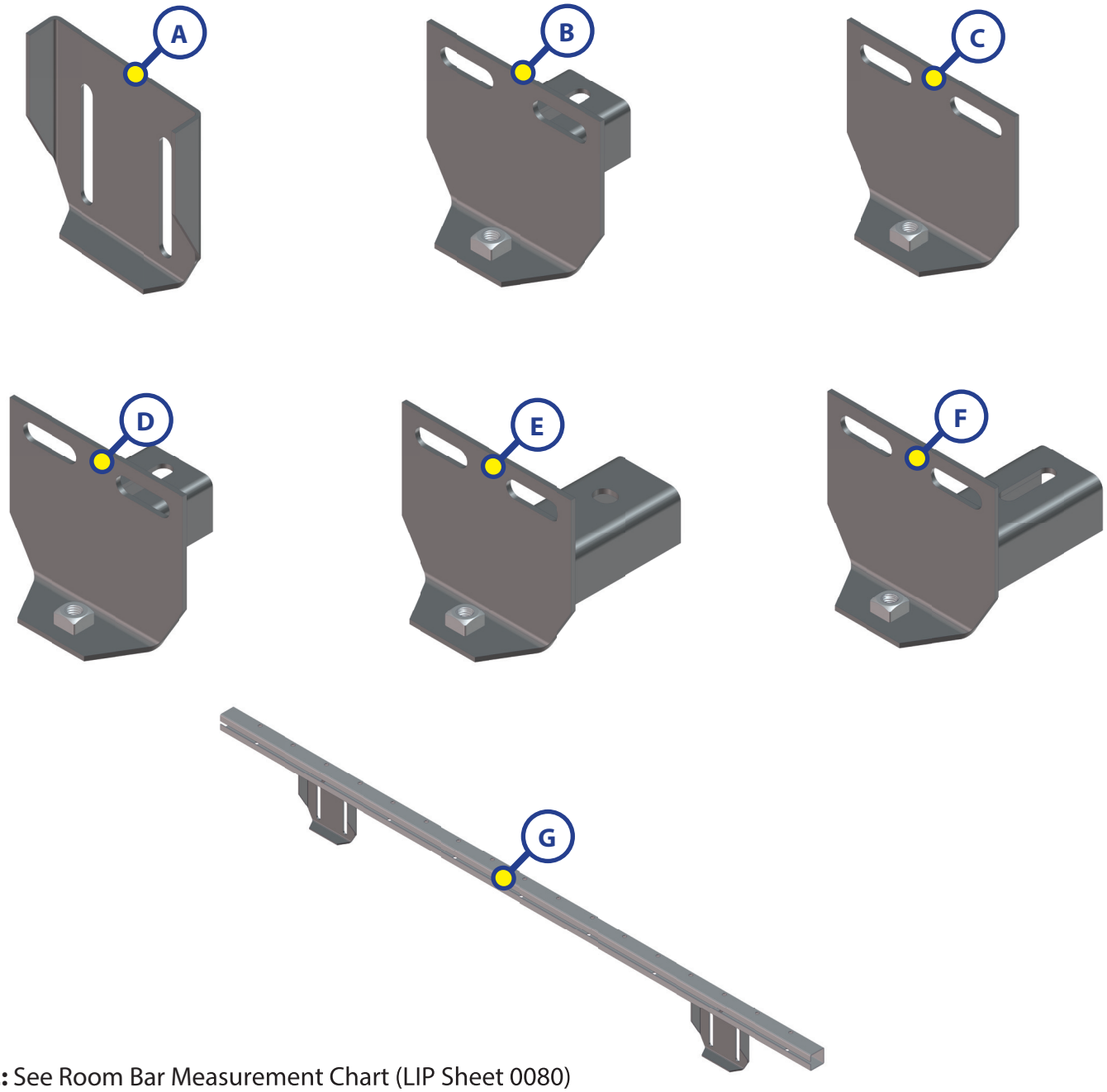






Callout	Part #	Description
A	122837	Gear Pack (Standard)
B	101941	Spur Gear (Standard)
C	123356	Gear Pack (Heavy Duty)
D	328044	Spur Gear (Heavy Duty)
E	103480	Wear Tab
F	277882	Wear Tab (Use with 317322 and 296121)
G	104474	Rear Roller
H	105893	Roller Shaft
I	113535	Front Cylinder Bracket
J	106040	Rear Cylinder Bracket
K	106030	Trim Plate
L	102357	Stiffener
M	106059	Hat Channel

2 X 2 HYDRAULIC THROUGH FRAME SLIDE-OUT COMPONENTS

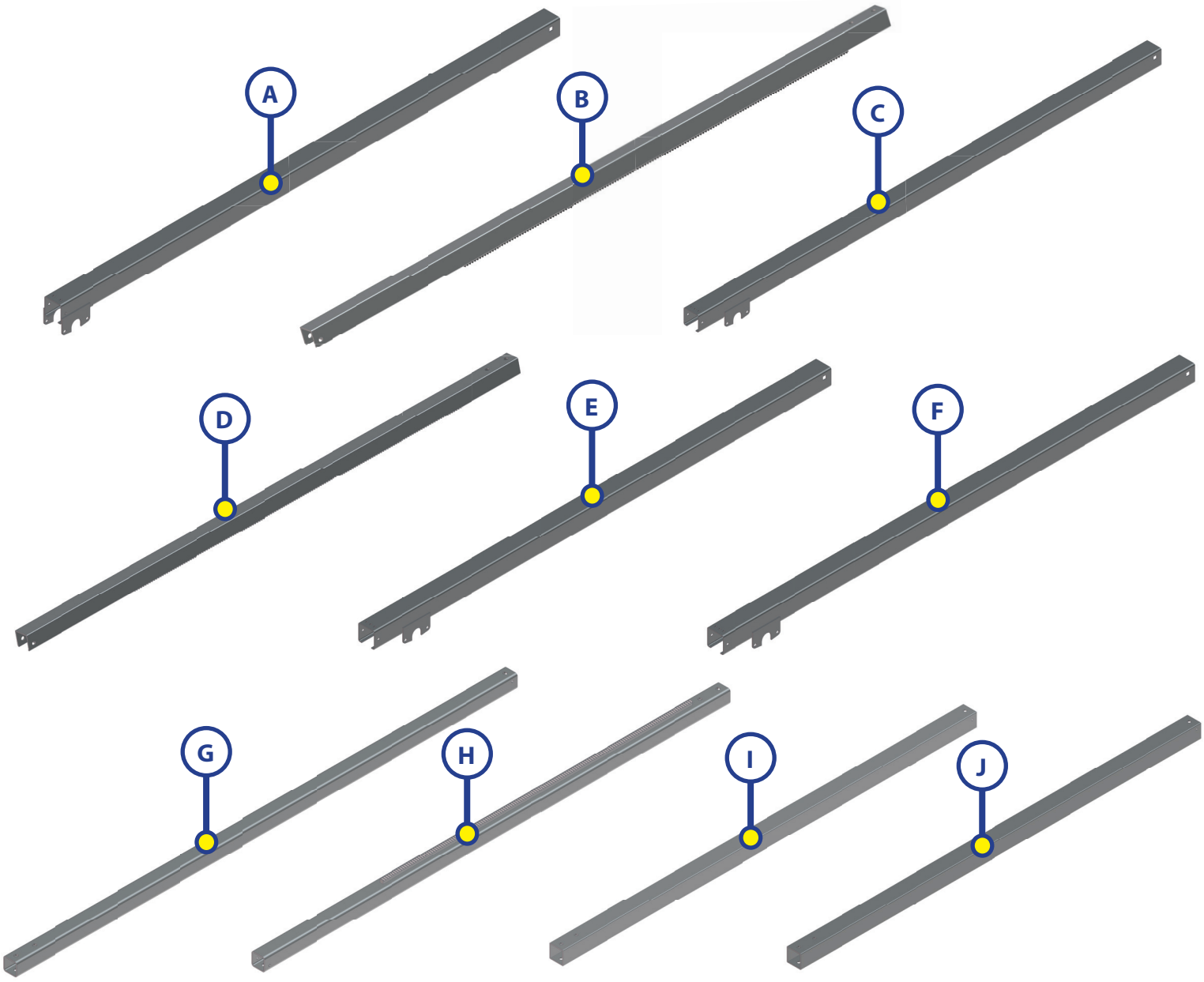


NOTE: See Room Bar Measurement Chart (LIP Sheet 0080)

Callout	Part #	Description
A	104851	Slide-out Mounting Bracket
B	141792	1 3/8" Adjustable Head Assembly
C	159624	Standard Weld-On Head Assembly
D	163049	Flush Adjustable Head Assembly
E	173593	Standard Flush Fixed Head Assembly
F	173594	Standard Flush Adjustable Head Assembly
G	183949	Room Bar (Use for up to 80")
	183950	Room Bar (Use for up to 154")
NOTE: Brackets can be shipped loose.		

2 X 2 HYDRAULIC THROUGH FRAME SLIDE-OUT COMPONENTS

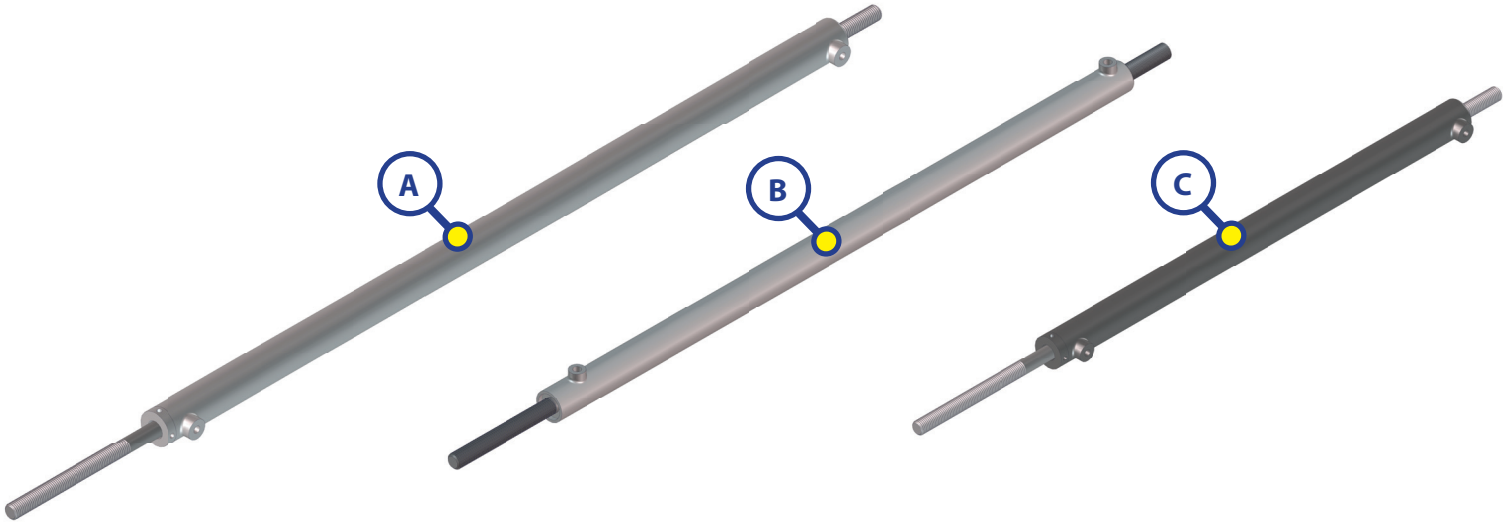
SLIDE-OUTS



Callout	Part #	Description
A	145735	Outboard Outer Arm (Idler)
	145734	Outboard Outer Arm (Drive)
B	145736	Outboard Inner Arm
C	173204	Inboard Outer Arm 76" (Idler and Drive)
D	163778	Inboard Inner Arm
E	161014	Inboard Outer Arm 69" (Idler and Drive)
F	159389	Inboard Outer Arm 70" (Idler and Drive)
G	301393	Inboard Inner Arm (18 Teeth)
H	296090	Outboard Inner Arm (18 Teeth)
I	296121	Inboard Inner Arm (No Rear Roller)
J	317322	Outboard Inner Arm (No Rear Roller)
NOTE: Standard slide-out arms have 15 teeth.		

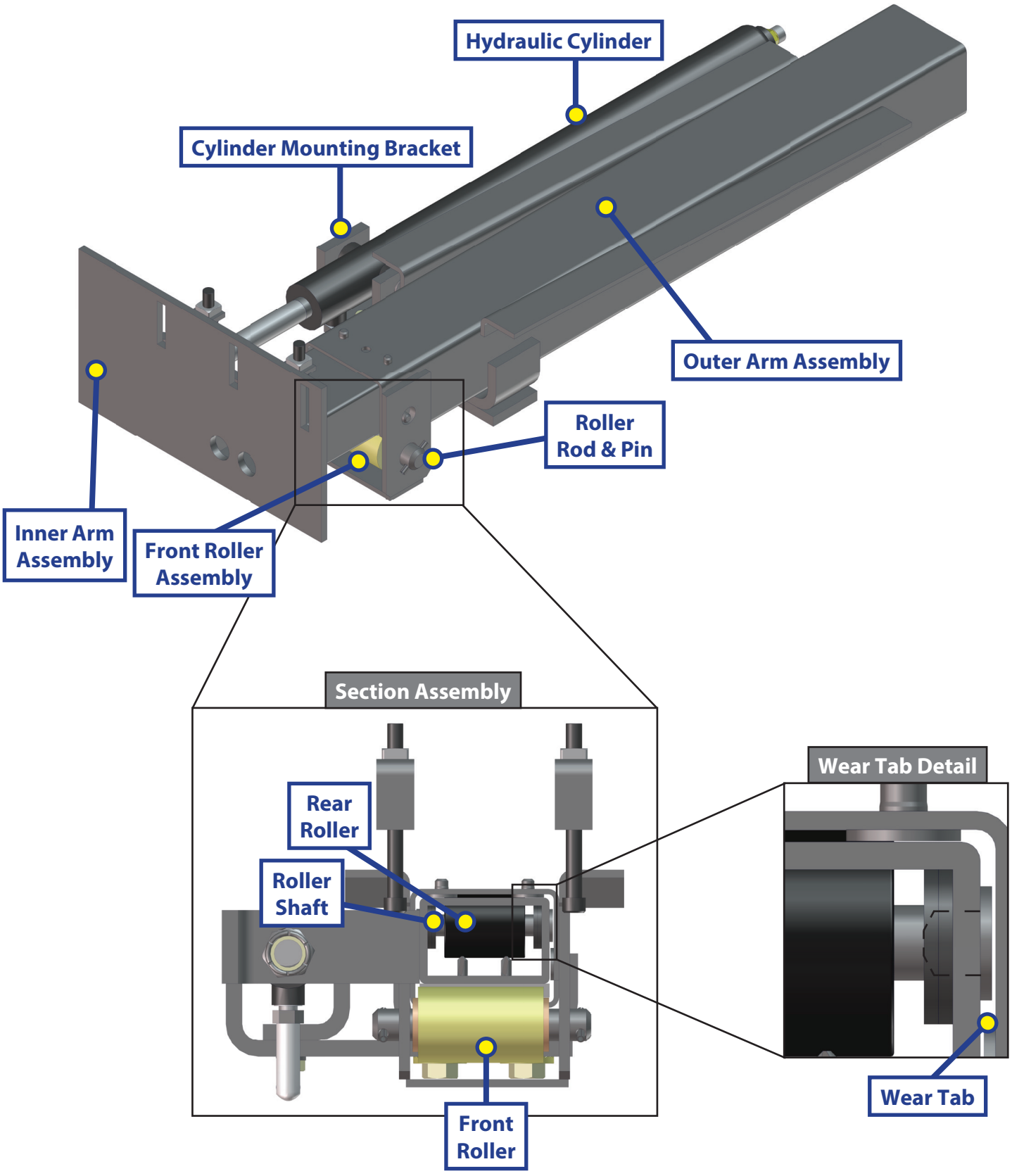
2 X 2 HYDRAULIC THROUGH FRAME DRIVE COMPONENTS

SLIDE-OUTS



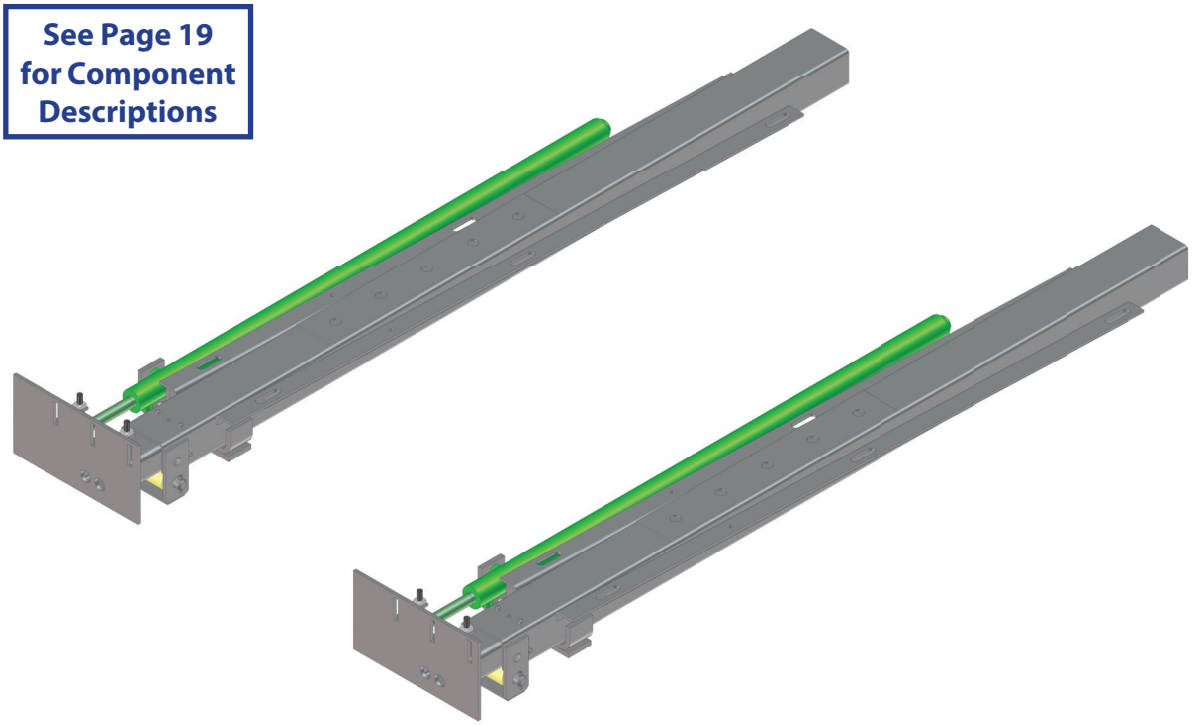
Callout	Part #	Description
A	123603	Hydraulic Cylinder 38"
B	133874	Hydraulic Cylinder 30"
C	125653	Hydraulic Cylinder 24"
D	141109	O-Ring Face Seal Straight Fitting
E	173738	O-Ring Face Seal Elbow Fitting
F	120639	Hydraulic Interior Slide-out Switch
G	140530	6 Prong Interior Switch with Wall Plate

2 x 3 Shorty Hydraulic Slideout



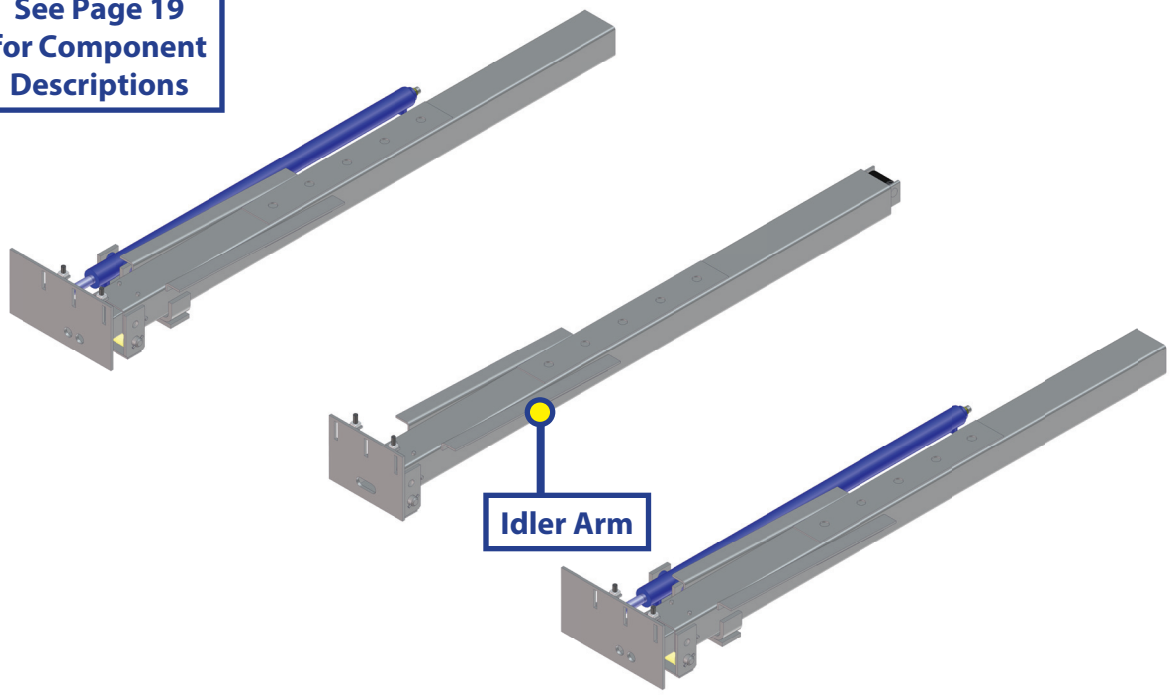
2 x 3 Bolt-In Hydraulic Slide-out

See Page 19 for Component Descriptions



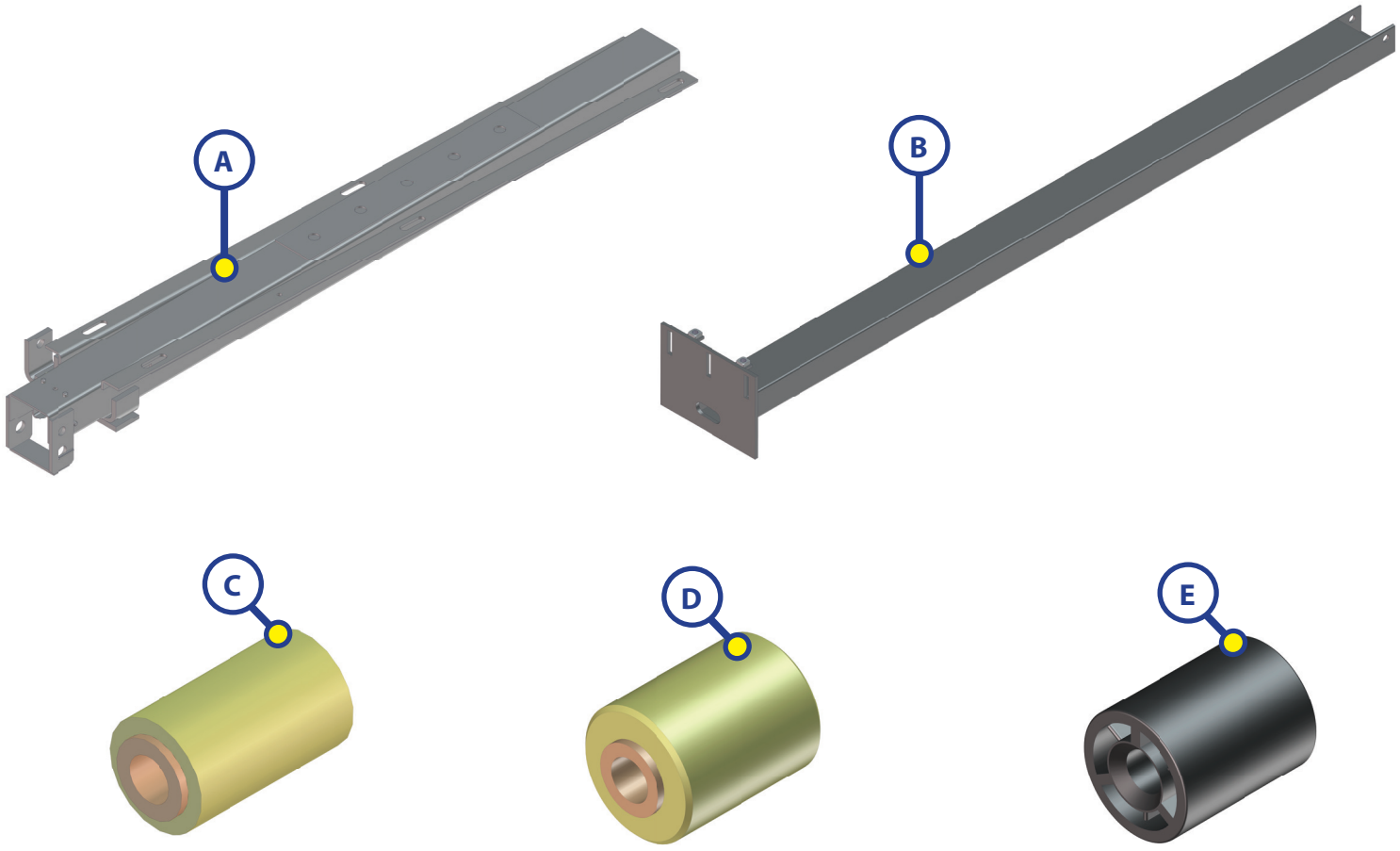
2 x 3 Full Wall Hydraulic Slide-out

See Page 19 for Component Descriptions



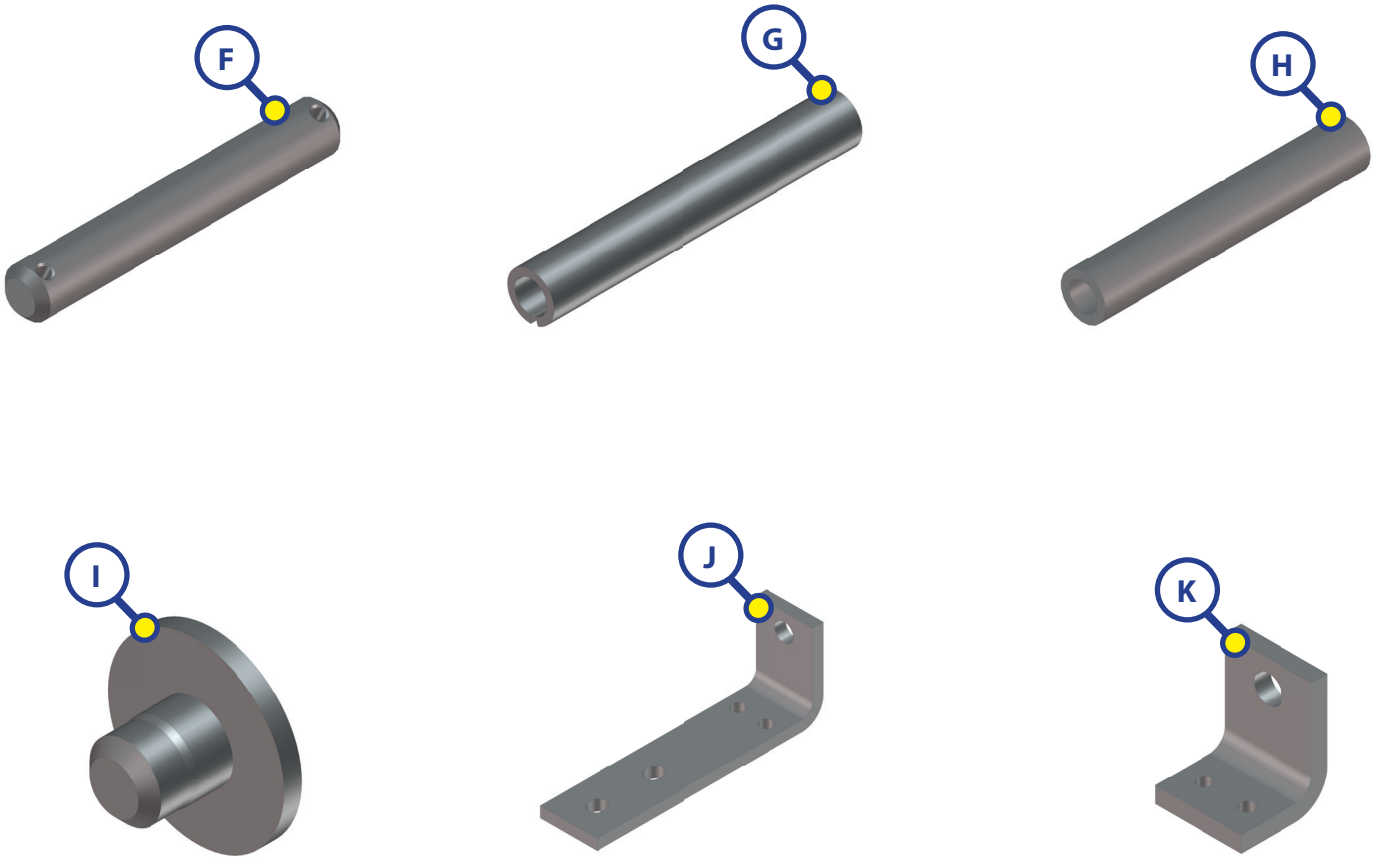
2X3 HYDRAULIC THROUGH FRAME SLIDE-OUT COMPONENTS

SLIDE-OUTS

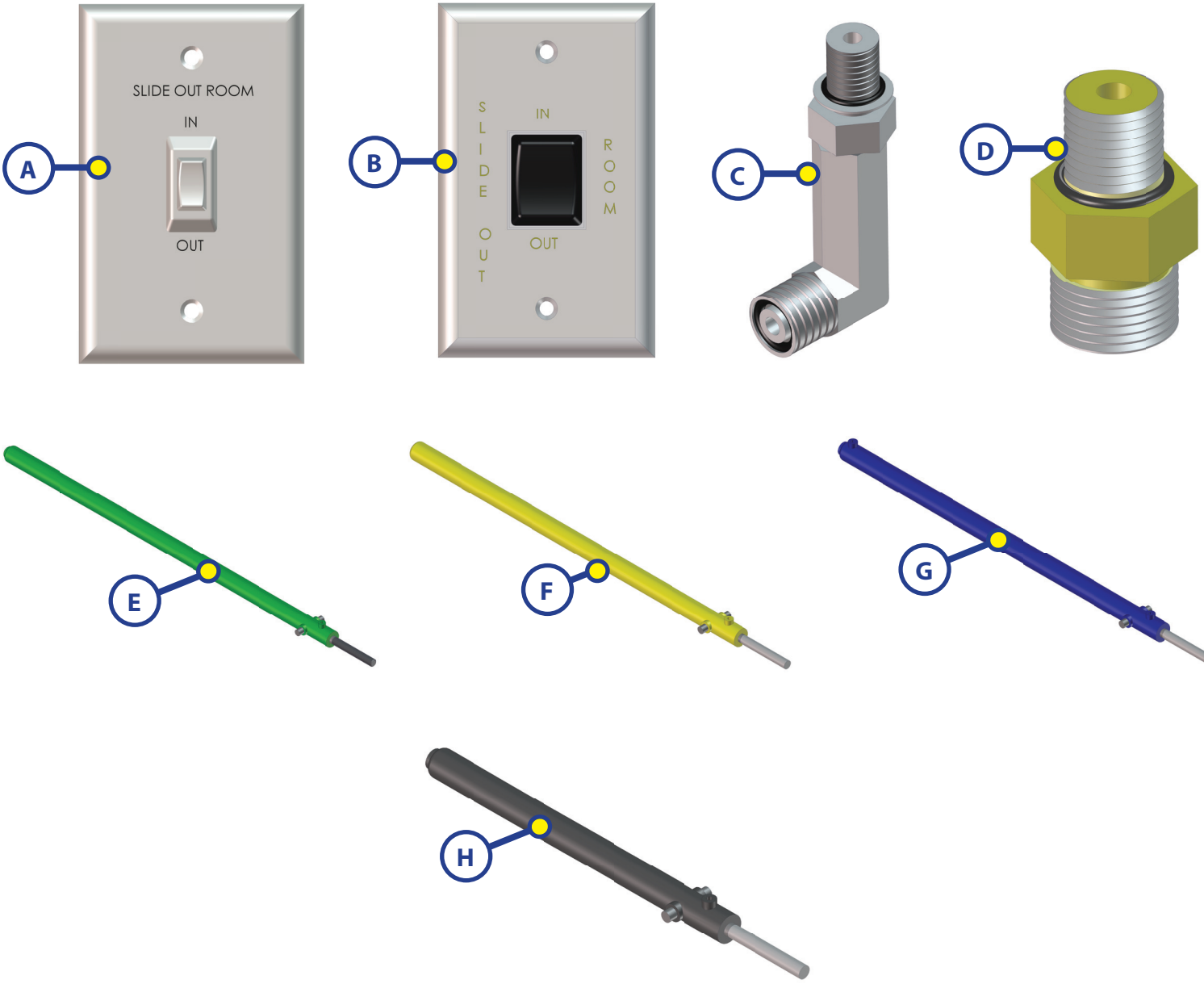


Callout	Part #	Description
A	201709	16" Stroke Outer Arm Assembly
	201708	30 ½" Stroke Outer Arm Assembly
	158564	31 ½" Stroke Outer Arm Assembly
	213654	36" Stroke Outer Arm Assembly
	203468	30" Full Wall Drive Arm Outer Assembly
	203470	30" Full Wall Passive Arm Outer Assembly
B	179024	16" Stroke Inner Arm Assembly
	179124	30 ½" Stroke Inner Arm Assembly
	158565	31 ½" Stroke Inner Arm Assembly
	213655	36" Stroke Inner Arm Assembly
	157692	30" Full Wall Drive Arm Inner Assembly
	157294	30" Full Wall Passive Arm Inner Assembly
C	135435	Roller Assembly
D	101255	Roller
E	104474	Rear Roller

2X3 HYDRAULIC THROUGH FRAME SLIDE-OUT COMPONENTS

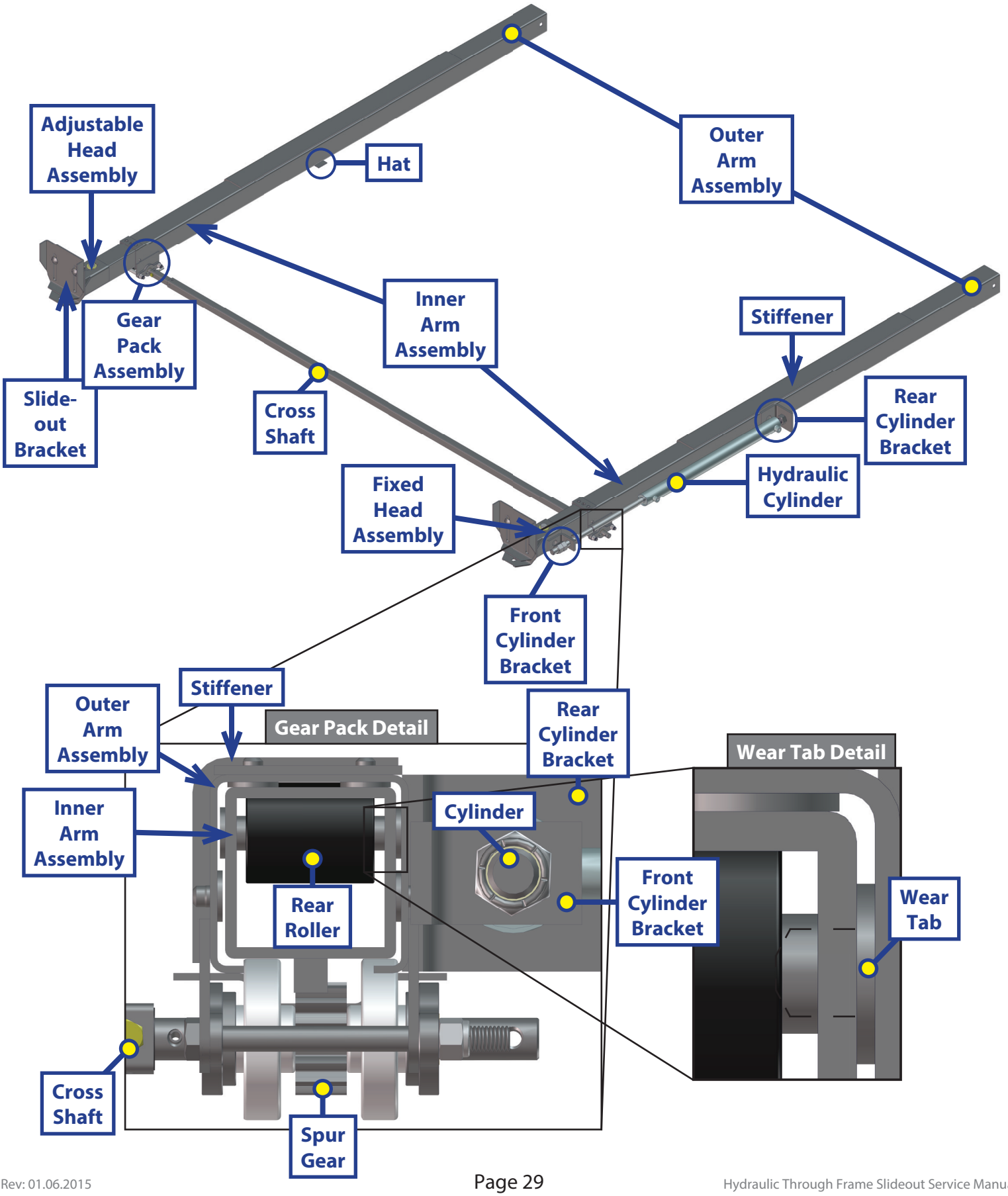


Callout	Part #	Description
F	128926	Rod
G	118174	Roll Pin
H	105895	Roller Shaft
I	103480	Wear Tab
J	115034	Cylinder Mounting Bracket
K	115035	Cylinder Mounting Bracket

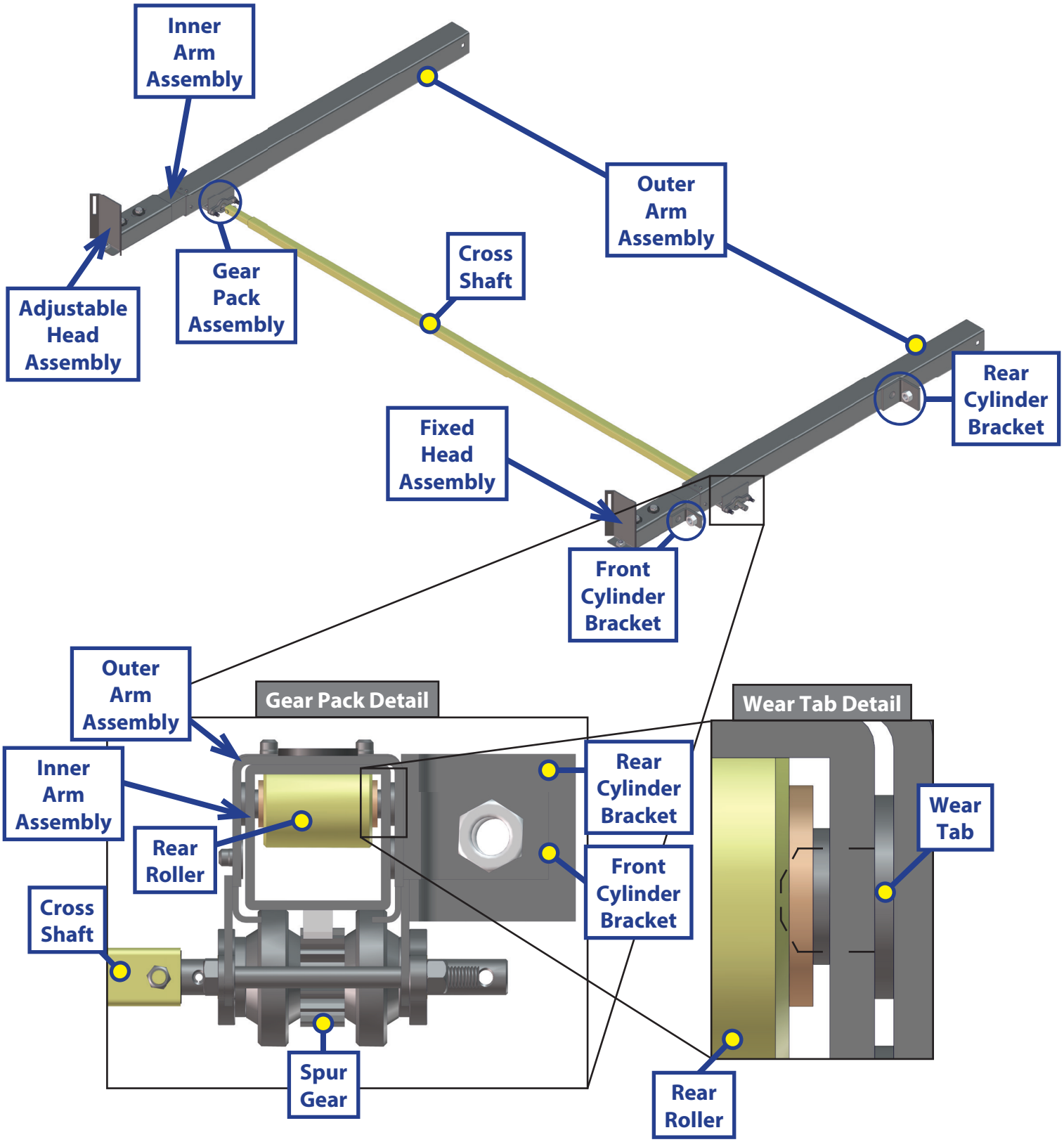


Callout	Part #	Description
A	120639	Hydraulic Interior Switch
B	140530	6 Prong Interior Switch with Wall Plate
C	173738	O-Ring Face Seal Elbow Fitting
D	141109	O-Ring Face Seal Straight Fitting
E	213750	36 ½" Hydraulic Cylinder
F	158499	31 ½" Hydraulic Cylinder
G	138720	30 ½" Hydraulic Cylinder
H	140930	16 ½" Hydraulic Cylinder

2.5 X 2.5 HYDRAULIC THROUGH FRAME ASSEMBLY

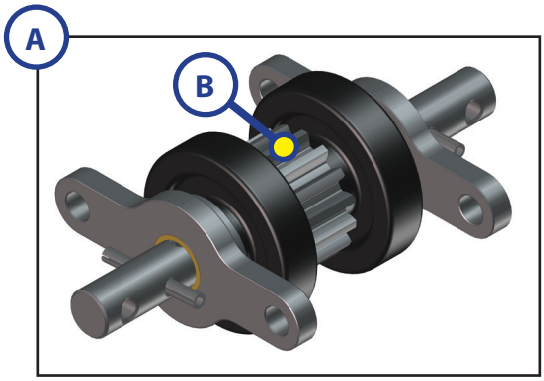


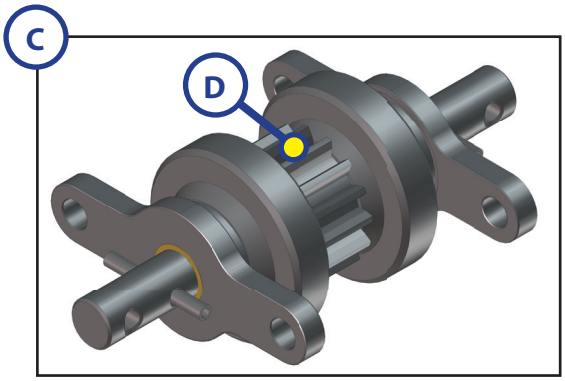
2.5 X 2.5 HYDRAULIC THROUGH FRAME V-TECH ASSEMBLY

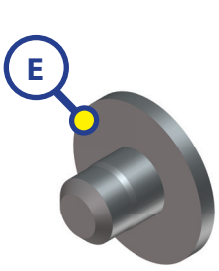


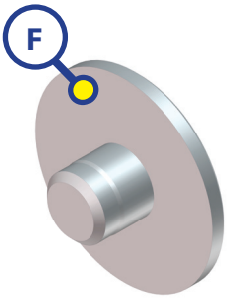
2.5 X 2.5 HYDRAULIC THROUGH FRAME COMPONENTS

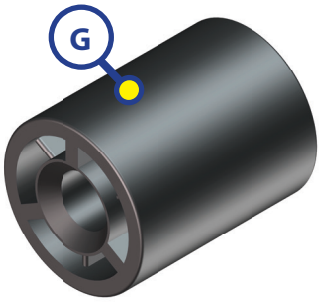
SLIDE-OUTS

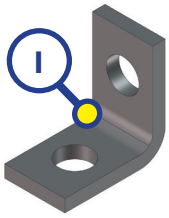


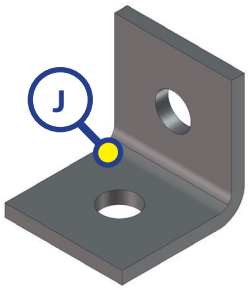


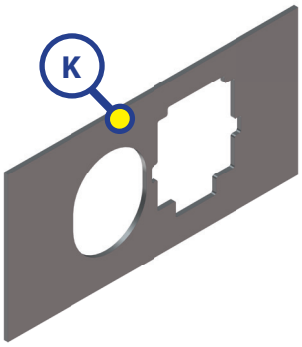


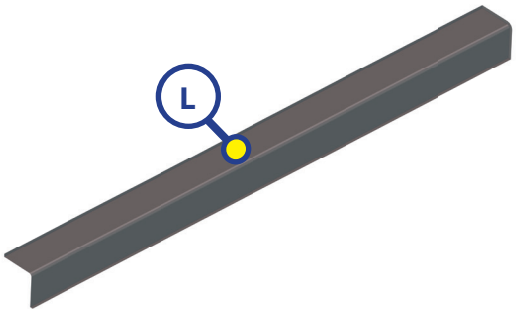








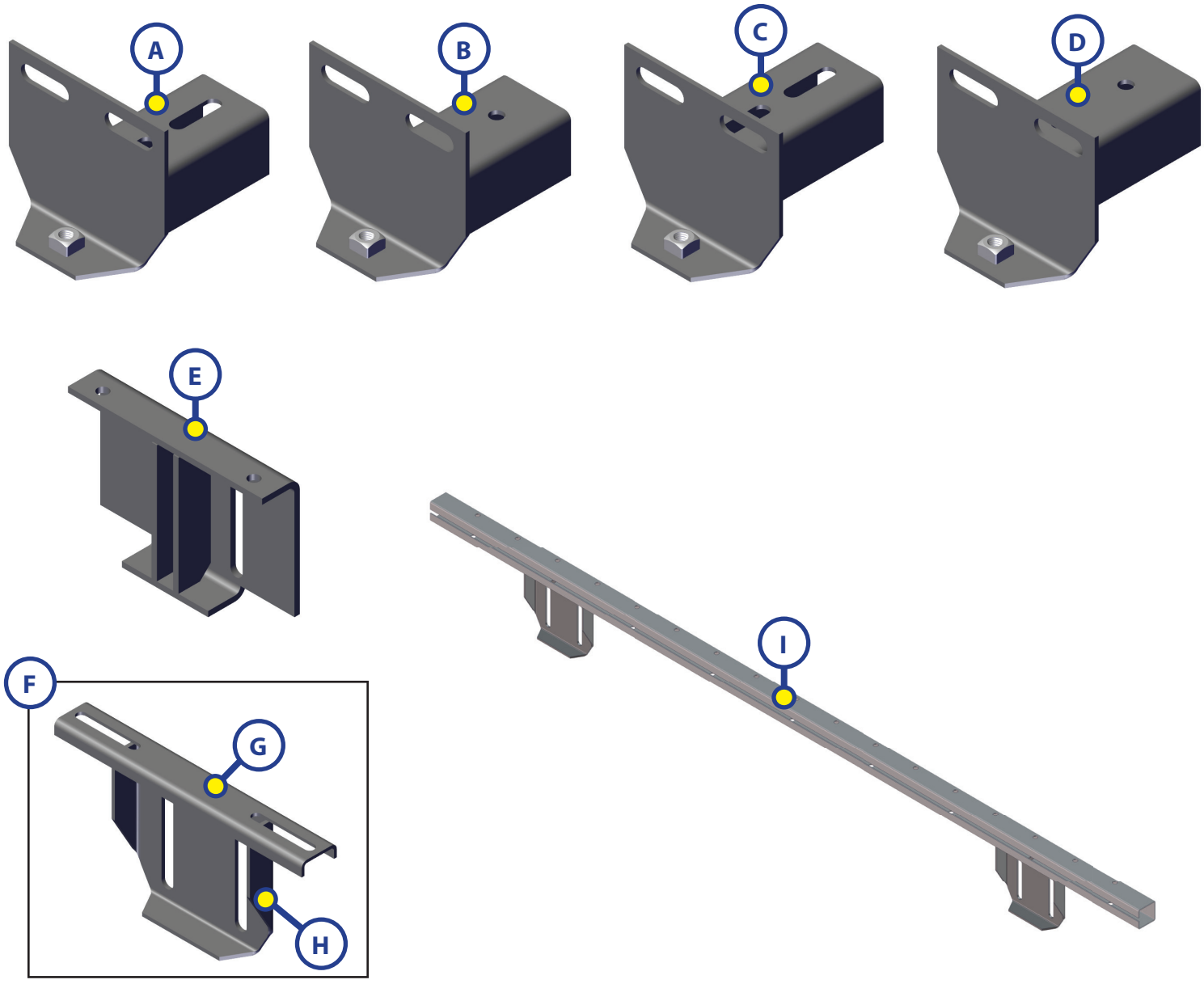




Callout	Part #	Description
A	122837	Gear Pack (Standard)
B	101941	Spur Gear (Standard) -15 Teeth - 10 DP/20° PA
C	123356	Gear Pack (Heavy Duty)
D	328044	Spur Gear (Heavy Duty) - 15 Teeth - 10 DP/20° PA
E	103480	Wear Tab
F	277882	Wear Tab (for 317322 Outboard Inner Arm - 18 Teeth)
G	104474	Rear Roller
H	105893	Roller Shaft
I	113535	Front Cylinder Bracket
J	106040	Rear Cylinder Bracket
K	106030	Trim Plate
L	102357	Stiffener

2.5 X 2.5 HYDRAULIC THROUGH FRAME MOUNTING COMPONENTS

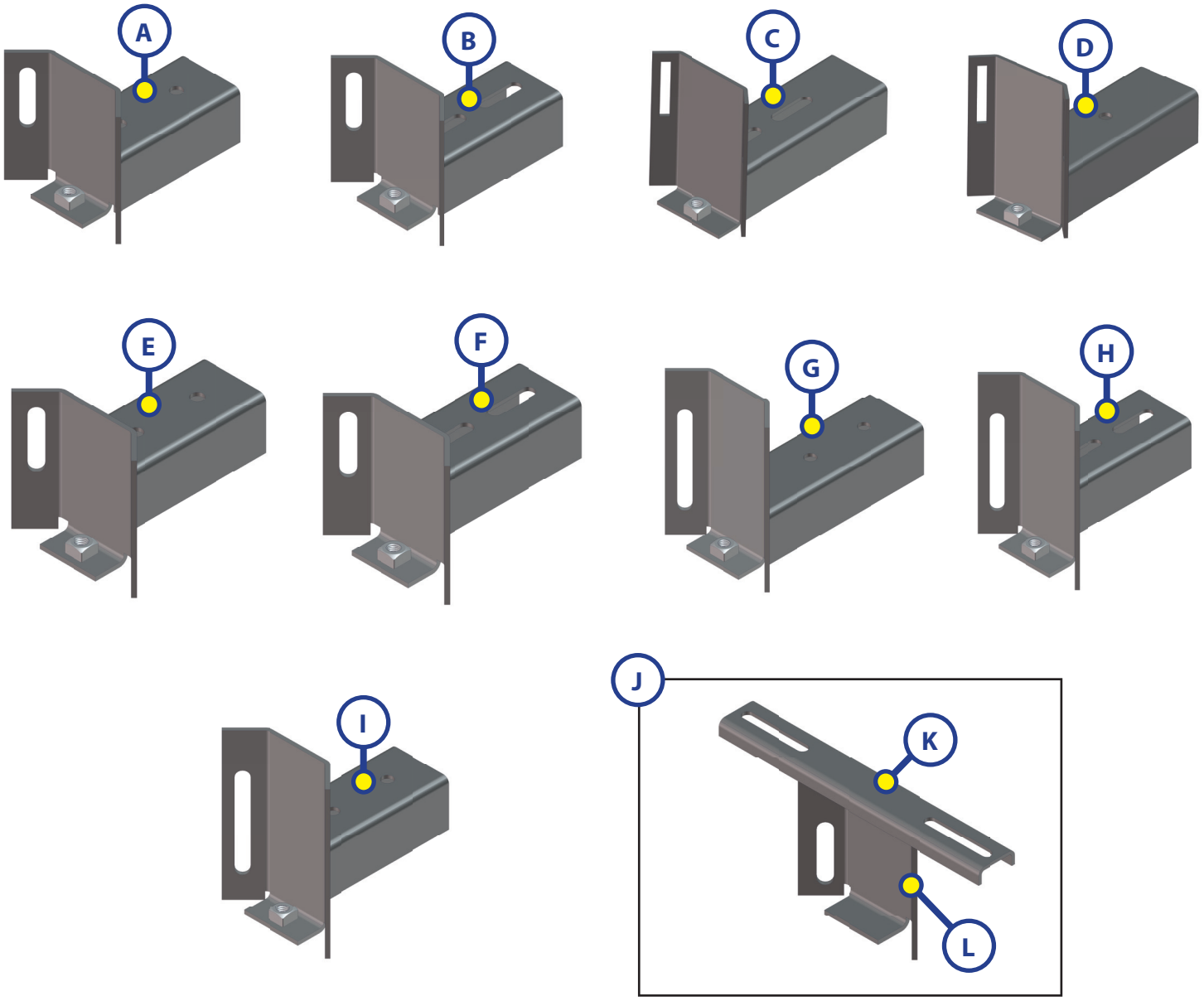
SLIDE-OUTS



Callout	Part #	Description
A	119047	Flush Adjustable Head Assembly
B	119048	Flush Fixed Head Assembly
C	122854	Adjustable Head Assembly (1 3⁄8")
D	122855	Fixed Head Assembly (1 3⁄8")
E	166536	Flush Floor End Condition
F	226347	Room Bar Mounting Assembly (12")
G	105966	Room Bar Bracket
H	104851	Slide-out Mounting Bracket
I	183949	Room Bar (Use for up to 80")
	183950	Room Bar (Use for 81" to 154")

2.5 X 2.5 HYDRAULIC THROUGH FRAME V-TECH MOUNTING COMPONENTS

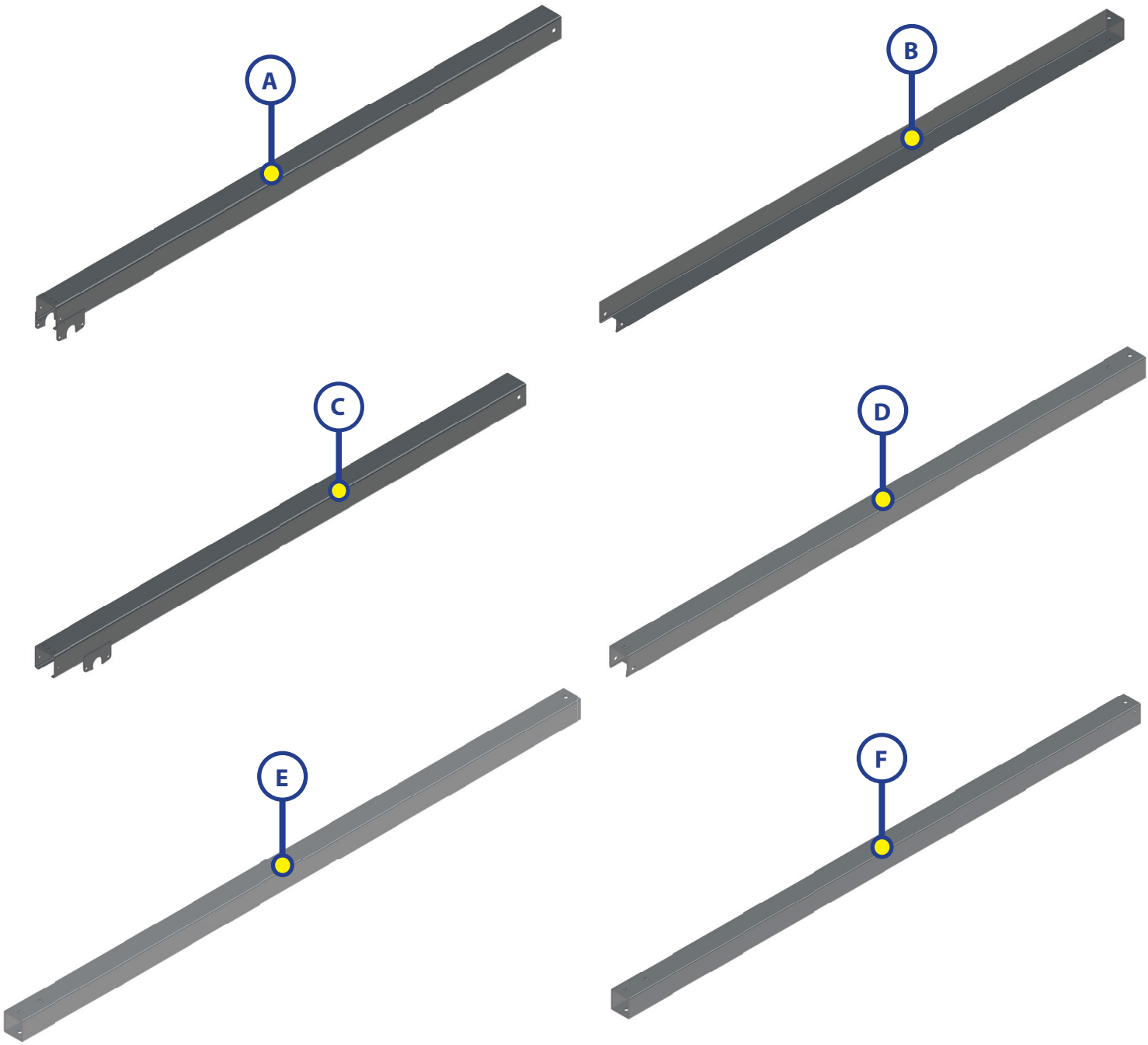
SLIDE-OUTS



Callout	Part #	Description
A	118127	Flush Fixed Head Assembly
B	119157	Flush Adjustable Head Assembly
C	123999	Flush Adjustable, Tall & Extended Head Assembly
D	124000	Flush Fixed, Tall & Extended Head Assembly
E	145388	1 ⅜" Fixed Head Assembly
F	145389	1 ⅜" Adjustable Head Assembly
G	146612	Flush Fixed, Tall & Extended Head Assembly
H	151474	1 ⅜" Adjustable Head Assembly
I	151475	1 ⅜" Fixed Head Assembly
J	180461	Room Bar Mounting Assembly
K	105966	Room Bar Bracket
L	103139	Slide-out Mounting Bracket

2.5 X 2.5 HYDRAULIC THROUGH FRAME ARM COMPONENTS

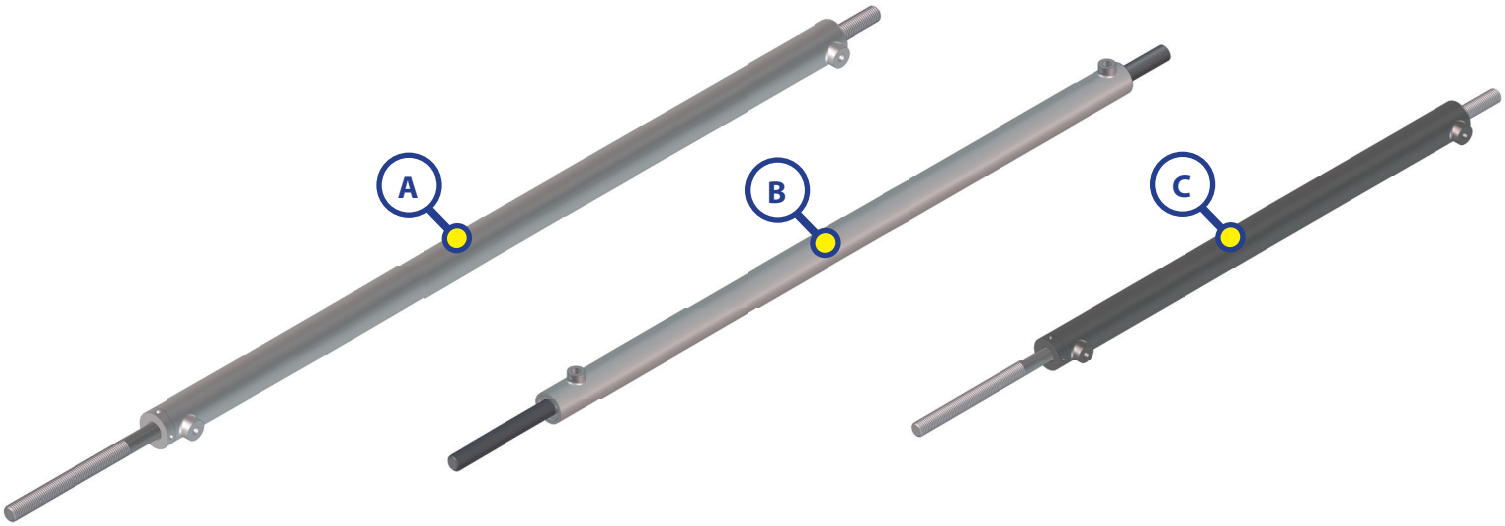
SLIDE-OUTS

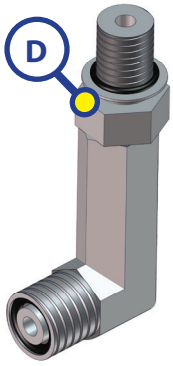


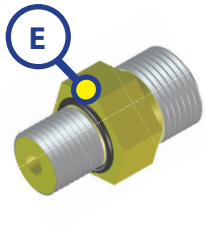
Callout	Part #	Description
A	143674	Outboard Outer Arm (Idler)
	143675	Outboard Outer Arm (Drive)
B	143707	Outboard Inner Arm
C	143676	Inboard Outer Arm (Idler)
	143677	Inboard Outer Arm (Drive)
D	143710	Inboard Inner Arm - 10 DP/20° PA
E	296121	Inboard Inner Arm - 12 DP/14.5° PA
F	317322	Outboard Inner Arm - 12 DP/14.5° PA

2.5 X 2.5 HYDRAULIC THROUGH FRAME DRIVE COMPONENTS

SLIDE-OUTS

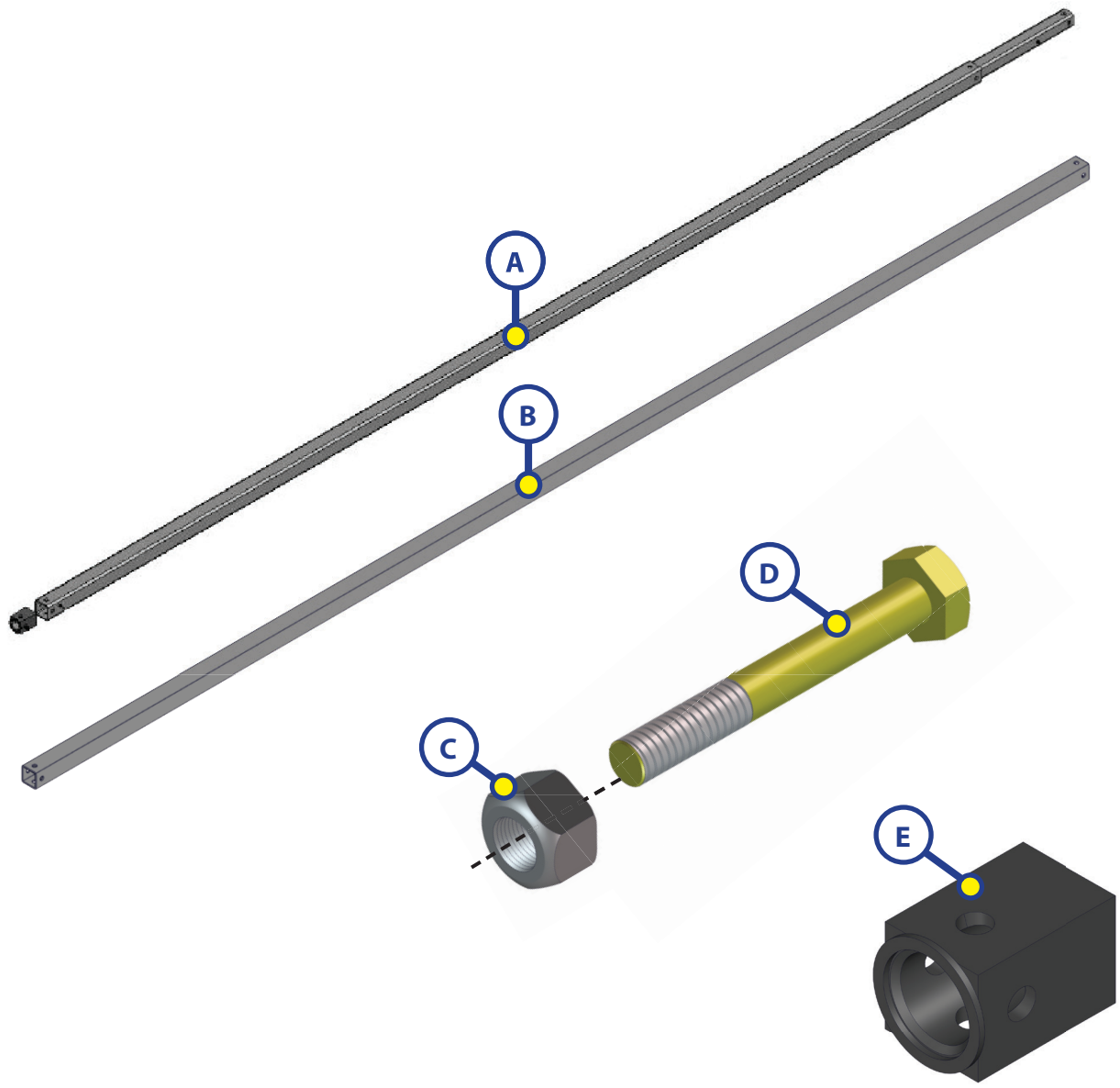






Callout	Part #	Description
A	123603	Hydraulic Cylinder 38"
B	133874	Hydraulic Cylinder 30"
C	125653	Hydraulic Cylinder 24"
D	173738	O-Ring Face Seal Elbow Fitting
E	141109	O-Ring Face Seal Straight Fitting
F	120639	Hydraulic Interior Slide-out Switch
G	140530	6 Prong Interior Switch with Wall Plate

2.5 X 2.5 HYDRAULIC THROUGH FRAME SLIDE-OUT CROSS SHAFT COMPONENTS



Callout	Part #	Description
A	157523	Cross Shaft Kit
B	117630	Outer Cross Shaft
	117606	Inner Cross Shaft
C	118092	Nut ¼" - 20
D	119066	Bolt 1/4" - 20 x 2"
E	123365	Cross Shaft Insert

LIPPERT COMPONENTS™

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